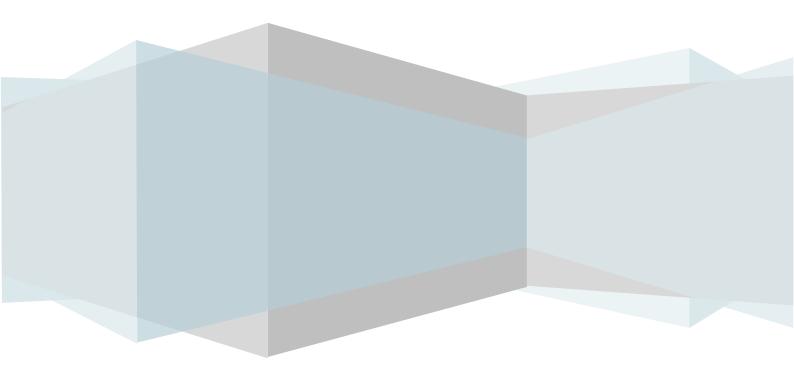


# SURVIVAL GUIDE TO USE THE NEW HYDROSWEEP DS3 ON FS-POLARSTERN

# **Expedition ANTXXVII/1, October-November 2010**

Laura Fillinger, PhD student, AWI



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INTRODUCTION

#### GOAL OF THIS GUIDE

This guide has been developed in order to help non specialists to get an image of the seafloor with the new multibeam echo sounder Hydrosweep DS3 on the R.V. Polarstern when no one from the bathymetry section is on board.

It focuses on the steps needed from turning on the acoustic device until getting an acceptable display in Hypack.

This instrument is anything but trivial. There are many things you could do wrong so please try to stay in the frame described within those pages. Think other people will come after you who also would like to use it without having to fight with the parameters that you might have changed.

The author (who hasn't studied bathymetry) would like to remind the people interested in using the multibeam to map the seafloor that they should get help from a specialist!

Nevertheless, she has written this guide because it wasn't possible for her so she understands you!

Have a nice and successful cruise!!! Might the Hydrosweep be nice with you!!!

P.S. When you actually get it to run properly, avoid changing the parameters again unless necessary !!!

#### THINGS YOU WILL NEED

#### HARDWARE

- Serial-usb adaptor
- Ethernet cable
- External disc (1Tera)
- CDRW/DVDRW
- For Valeport (if used): Batteries Duracell Procell C MN1400 LR14 1.5V Alcaline

#### SOFTWARE

CDs with setups as backup!! Some dongles are available for additional licenses (check with the bathymetry section).

Type of work	Software	Application	Availability
Data recording	DataLog Express	Deployment/recovery of Valeport (SVP)	CD on board with instrument
Data recording	CTD software	Deployment/recovery of Seabird CTD	Installed on a computer on Polarstern
Data processing	SVP.exe	SVP data cleaning for integration to Hypack	Installed in HS room on Polarstern
Network	Atlas Hydromap Server	Communication between database and system	Installed in HS room on Polarstern
Data recording	Atlas Hydromap Control	Setup the connection with the multibeam echo sounder	Installed in HS room on Polarstern
Data recording	Hypack	Software associated to Hydrosweep Real time display of multibeam bathymetry and side scan sonar	Installed in HS room on Polarstern, on the bridge and in the winch control room.
Network	UltraVNC Viewer	Display screens from one computer on another	Installed in HS room on Polarstern, on the bridge and in the winch control room.
Network	UltraVNC Server	Get license from one computer on another	Installed in HS room on Polarstern, on the bridge and in the winch control room.

#### DATA

We recommend you to get in touch with the AWI Bathymetry section before your cruise in order to check if there are any existing charts for the area where you intend to work.

Data that might be useful onboard:

- Past CTD/SVP profiles of the area in case you are unable to do one by yourself
- Existing georeferenced maps of the seafloor (geotif) in your area. (Can be opened in Hypack.)

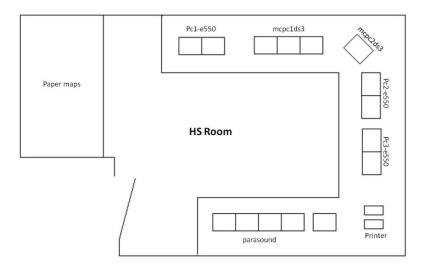
This data will help you setting priorities, choosing the useful parameters and checking where data is already available in order to complete the charts or to spare time.

#### WHERE IS WHAT?

#### ROOM DESCRIPTION

The Hydrosweep (HS) room is located on the E deck (E-550 "Technische Büro" "HS-PS Zentrale") on Polarstern. The following drawing show you the location of the bathymetry dedicated computers, their name and the number of screens available for each.

To avoid unnecessary warming of the room please switch off all unused computers **EXCEPT Pc1-e550** which has to remain switched on all the time!!!



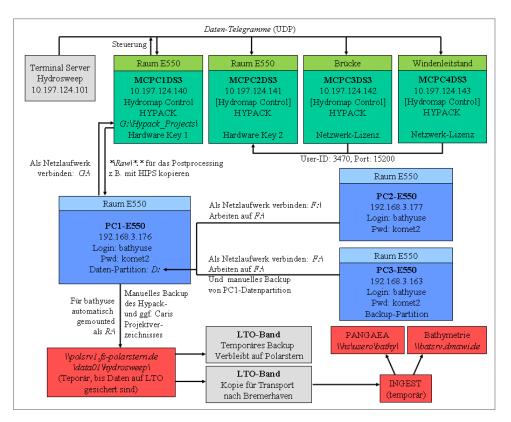
#### SOFTWARE

The following table lists the software available on each computer of the HS room that you might need.

Computer	Software	Path
Pc1-e550: server	Svp.exe	D:\software\executables
Login: bathyuse	Trackplaner.exe	D:\software\executables
Password: komet2		
Pc2-e550	Svp.exe	F:\software\executables
Login: bathyuse	Trackplaner.exe	F:\software\executables
Password: komet2		
Рс3-е550	Svp.exe	F:\software\executables
Login: bathyuse	Trackplaner.exe	F:\software\executables
Password: komet2		
Mcpc1ds3	Atlas Hydromap Server	Desktop
	Atlas Hydromap Control	Desktop
	Atlas Sensor Manager	Desktop
	Hypack	Desktop
	UltraVNC Viewer	Desktop
Mcpc2ds3	Atlas Hydromap Server	Desktop
	Atlas Hydromap Control	Desktop
	Atlas Sensor Manager	Desktop
	Hypack	Desktop
	UltraVNC Viewer	Desktop
Mcpc3ds3	Hypack	Desktop
(on bridge)	UltraVNC Viewer	Desktop
Mcpc4ds3	Hypack	Desktop
(in winch control	UltraVNC Viewer	Desktop
room)		

#### SYSTEM

The following drawing describes the infrastructure of the Hydrosweep system and the data flow.



#### CALIBRATION

Calibration is needed when a new echo sounder or a new component is installed. It is a complex procedure which should only be executed by experienced staff of the bathymetry section.

As calibration has been done during ANTXXVII/1, it shouldn't be needed for the upcoming expeditions unless some components are replaced.

#### SOUND VELOCITY PROFILES (SVP)

Sound velocity profiles are needed to get precise measurements of the bathymetry with a multibeam echo sounder. They should be recorded at least once for each region to be mapped (more often if you expect the profile to change significantly):

- Before the mapping starts for direct display of precise depth
- During the survey if the profile changes or if else not possible
- After the survey (from theoretical models) for integration during the post processing.

SVP can be calculated from CTD profiles or measured via a Valeport. The best option is to measure the SVP down to the sea bottom. If this reveals impossible, you will have to extrapolate the profile by yourself.

#### CTD: CONDUCTIVITY, TEMPERATURE, DEPTH PROFILER

On stations where the CTD is deployed anyway, you can determine the sound velocity profile from the CTD data to spare time.

In this case you don't have to worry about programming the CTD and recovering the data, some people will be busy doing it!

Several calculations can be made from the raw data. You just have to describe what you need to the people responsible for the data collection.

You need the sound velocity calculated in 1m depth increment on the way down.

#### VALEPORT: SOUND VELOCITY PROFILER

In case no CTD profile is planned on the area where you want to use the multibeam echo sounder the easiest way to get the SVP is to use the Valeport available onboard.

#### CHARACTERISTICS OF THE POLARSTERN VALEPORT

Onboard FS Polarstern is a Valeport Limited, MIDAS SVP with the following sensors:

- Sound velocity sensor: range 1400 to 1600m/s, accuracy ~0.03m/s, resolution 0.001m/s
- **Pressure sensor**: temperature compensated, range 600Bar (6000m depth), precision ~0.6m, resolution 0.06m
- **Temperature sensor**: range -5 to 35°C, accuracy ~0.01°C, resolution 0.002°C

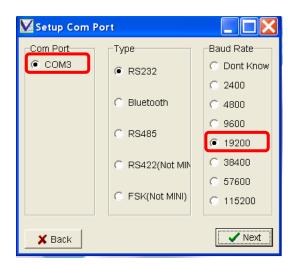
#### VALEPORT: PROGRAMMING AND DEPLOYMENT

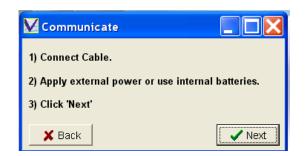
Software: DataLog Express

#### START COMMUNICATION



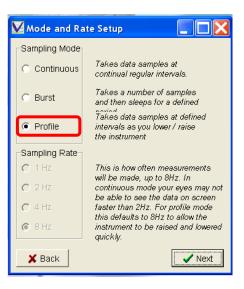
Check the Com Port number!!

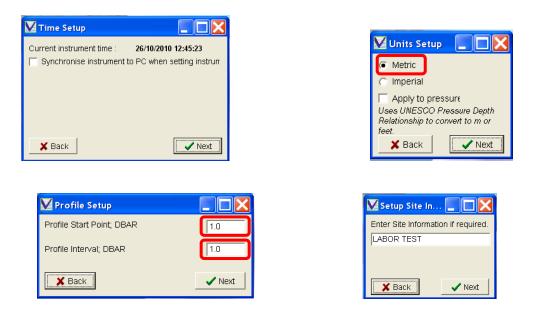




#### VALEPORT SETUP

Communications Established!	
Communications established with:	What do you want to do?
MIDAS SVP 6000 S/N 34079.	Change Setur Change the way the instrument operate
RS232 @ 19200 baud.	(The current settings are indicated to le
Sampling Mode : PROFILE	
Sampling Rate : 8 Hz	Upload Screen Extract data from instrument to PC
Profile Start : 1	
Profile Increment : 1	Run Prepare to deploy instrument.
Brossure Tere : 10 220:26/10/2010 07:40:10	Change Baud Rate Change the instrument baud rate.
Pressure Tare : 10.239;26/10/2010 07:49:18 Memory Free : 66,923,736 bytes of 64Mb	
PSU Volts : -0.104 V	X Cancel Return to opening DataLog Express sci
Lithium Volts : 3.051 V	



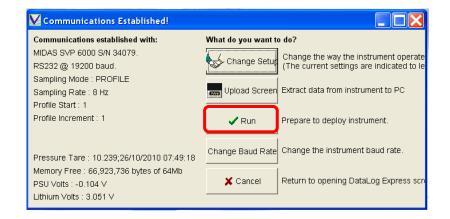




**Set pressure tare**: measures the pressure at sea level (atmosphere) and subtract this value from each subsequent pressure reading (recommended for profiling mode)

**Zero pressure tare**: take into account variations of the atmospheric pressure (added as a text file to the program, recommended for long term deployment.

#### VALEPORT DEPLOYMENT



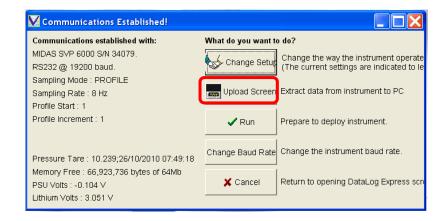


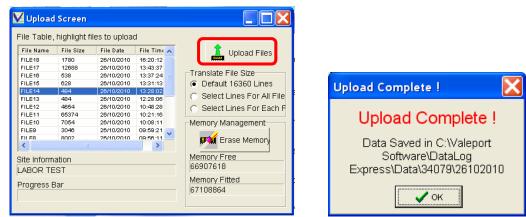


## VALEPORT: DATA RECOVERY

Start the communication with the instrument as described in the start communication section.

#### DOWNLOAD DATA FROM INSTRUMENT





#### Data are stored by default in:

C:\Valeport Software\DataLog Express\Data\34079\ddmmyyyy

If the data are safe and there is a need for space in the instrument memory it is possible to erase the data.

ile Table,	highlight fi	les to upload	d	
File Name FILE18	File Size 1780	File Date 26/10/2010	File Time 16:20:12	- Lpload Files
FILE17 FILE16	12688 538	26/10/2010 26/10/2010	13:43:37 13:37:24	Translate File Size
FILE15 FILE14 FILE13	628 484 484	26/10/2010 26/10/2010 26/10/2010	13:31:13 13:28:02 12:28:06	<ul> <li>Default 16360 Lines</li> <li>Select Lines For All Fil</li> </ul>
FILE12 FILE11	4654	26/10/2010	10:48:28	<ul> <li>Select Lines For Each</li> </ul>
FILE10 FILE9	7054 3046	26/10/2010 26/10/2010	10:08:11	Memory Management
FII F8 <	8002	26/10/2010	09:56:11	Erase Memory
ite Inform ABOR TE				Memory Free 66907618
rogress E		Memory Fitted 67108864		

# OPEN FILE

Either directly from the dialog that opens when DataLog Express is started:

What Would Yo	ou Like To Do?
Communicate	Click this button to establish communications with your inst Use this to setup, extract / translate data or view data in re
Open File	Click this button to open data files you have previously upl
? About	Click this button to see the software version number.
🗙 Exit	Click this button to exit DataLog Express now.

Or from the menu: File> Open file (ctrl+O)

In both cases you land on the following interface:

Öffnen					<u>?</u> ×
Suchen in:	26102010		•	€ 💣 📰 ▼	
Zuletzt verwendete Dok	FILE8.000				
Desktop					
Eigene Dateien					
Arbeitsplatz					
<b>S</b>	Dateiname:			•	Öffnen
Netzwerkumgebu	Dateityp:	MIDAS / MODUS Data Files		•	Abbrechen

#### Data are stored by default in:

C:\Valeport Software\DataLog Express\Data\34079\ddmmyyyy

When you open the file nothing seems to happen: you need to choose a display type.

For this in the menu bar: display type>scroll display

At first the window appears empty of records, but if you right click on it, you can choose the sensors you'd like to display.



#### Types of display:

Scroll display				_			Pro	file di	splay	,					
V Scroll V	Window				Pro	file Grapi	h Windo	w							
Date	Time	SOUND VELOCITY;M	PRESSURE;DBAR	TEMPERATURE;C			2	— sou	ND VELOC	ITY; M/SEC	Г — Р	RESSURE,	DBAR		
27/10/2010	13:58:50	0.000	0.025	14.923	0.4		_	150	- Enventione		_	_	_		
27/10/2010	13:58:50	0.000	-0.005	14.949											
27/10/2010	13:58:49	1506.868	0.431	14.953	9										
27/10/2010	13:58:47	1506.883	0.953	14.959	24 10										
27/10/2010	13:58:47	1506.899	1.463	14.959	- 15 - 15										
27/10/2010	13:58:45	1506.895	1.975	14.951	0EPTH, 0BAR 05 51 01										
27/10/2010	13:58:44	1506.884	2.466	14.937	25										
27/10/2010	13:58:43	1506.861	2.957	14.935	30										
27/10/2010	13:58:43	1506.859	3.428	14.939	- <sup>30</sup> 1	100 70									
27/10/2010	13:58:42	1506.882	3.866	14.946				9.76	509.76 SO	709.76 UND VELO	909.7 CITY;M/SEC		19.76	1309.76	
27/10/2010	13:58:42	1506.909	4.456	14.945											
27/10/2010	13:58:41	1506.920	4.965	14.945		14.13	14.33	14.53	14.73	14.93	15.13	15.33	15.53	15.73	15.93
27/10/2010	13:58:39	1506.917	5.460	14.934		14.13	14.35			TEMPERA					

Graph display



You can organize several displays in the window and save your setting via:

User display> User display 1 (or 2)> Save

You can also name it: User display> User display 1 (or 2)> Rename

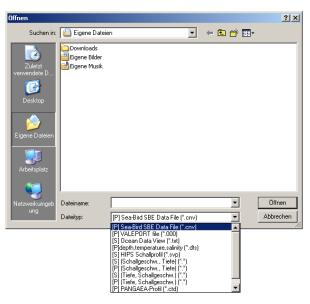
Next time you open a file you can load your display settings: User display> User display 1 (or 2)> Load

#### DATA CLEANING: SVP.EXE

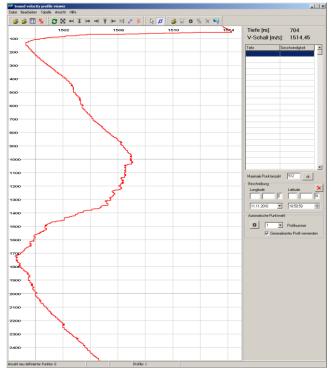
Hypack and Atlas Sensor Manager can integrate sound velocity profiles with a maximum number of 512 data points for Hypack and about 128 for Atlas Sensor Manager. Those data must also go down to the sea bottom. If your SVP or CTD file already fit to both those criteria then you might proceed further. If not it is necessary to prepare your CTD (.cnv) or SVP (.000) files before integrating them in Hypack and in Atlas Sensor Manager. For this you can use the small program svp.exe.

You can open CTD (.cnv) files containing sound velocity (check how to get these in the CTD section) or SVP (.000) files.

Datei > CTD offnen



If you don't see your data it might be that the dots are only too small to be seen. You can use this icon straw a line linking them.

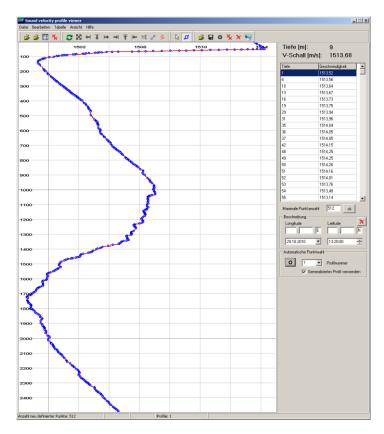


#### REDUCING THE NUMBER OF DATA POINTS

You have to fill the number of points you want (512 max for Hypack, 128 for Atlas Sensor Manager).

Maximale Punktanzahl	512 ok
Beschreibung	
Longitude	Latitude 🔀
: E	: N
11.11.2010 💌	18:50:59 🗧
– Automatische Punktwahl	
🔅 1 💌	Profilnummer
🔽 Generalisi	ertes Profil verwenden

And you can press this icon 🔯 to start the processing.



The program processes your profile to select 512 (the maximum number chosen) representative points. If there are some mistakes you can remove points manually by selecting them in the table and clicking this icon  $\nearrow$  in the menu bar (not near the coordinates).

#### EXTEND THE DATA TO THE SEA BOTTOM

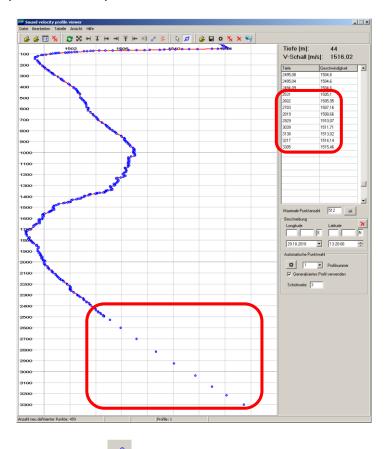
For your profile to be useful, it must go down to the seafloor. If for any reason you weren't able to get your instrument down to the bottom, you will have to extend it by hand in svp.exe.

For this, reduce your number of point below what is finally expected so that you can add some point without exceeding the maximum number (see previous section).

Then change the maximal number of point to the real max (512 or 128) again and click OK. You can now add points by hand.

These tools  $\leftarrow$  **I**  $\rightarrow$  enable you to extend your scale and panel for display so that you can add points deeper.

When this icon is selected you can add points into your profile by simply clicking on the position where you wish to add your point. The drawn points are added to the table.



You can link those points with this icon

Go on until you reach the deeper point you expect to find (even a bit deeper).

#### Remark about the extension to the seafloor

If you have no idea how the sound velocity varies with depth, some models exists (databases) or you could find older SVP. If you have no access to those, then we recommend you to extend you SVP below 1000-2000 by keeping the same slope down to the floor (as drawn above).

Any comments by oceanographers are here more than welcome!!!

#### CREATING THE NECESSARY FILES

When your new profile is ready you can save it:

Tabelle > Speichern

Hydromap Online Format (no extension)	
HYPACK format (*.vel)	
SIMRAD sound velocity profile (*.asvp)	
Simple HMO Format (*.*)	
Caris HIPS profile (*.svp)	

- As a velocity file (.vel) for Hypack
- As Hydromap Online format (no extension) for Sensor Manager

We recommend you to create both formats.

#### ATLAS HYDROMAP CONTROL: TURN ON THE HYDROSWEEP AND BASIC SETUP

First of all you should ask the ship technician responsible for it to turn on the sounder and which MINS (1 or 2) is used (usually MINS1 is used and you should always be warned if the MINS are switched). (MINS are Marine Initial Navigation System used to smooth the raw GPS position, depending on the ship's movements)

#### HOW TO START?

Turn on the main Hydrosweep computer (mcpc1ds3).

Atlas Hydromap Server should start automatically (check in the menu bar!!!) If it hasn't started (or if it stops during the logging) then start it manually (by simply clicking on the icon on the desktop).

Open Atlas Hydromap Control

User	Login ATLAS HYDROMAP CONTROL - Client
Administrator	HYDROMAP Administrator User
hydro	HYDROMAP Default User
Jser hydr	10
lser hydr 'assword	10

Identification: user = hydro, no password. This window opens:

🚳 ATLAS HYDROMA	P CONTROL	- Client 1 -				
Eile System Extras	Help					
] 🗊 II. ] 👸	1	🔑 🖳 🗄 🖞 🛛 🧇				
Echo Sounder Contr	ol		-Measurement Da	ata		
			Data Set Time			
Connection State			Data Set Age			[5]
Connection state			Depth			[m]
			-Water Sound	/elocity -		
			C-Mean			[m/s]
Transmission State		STOP				
			Ship's Data			
Sensor Operation St	ate		Draught		[m]	
				,		
User						
	ydro					]
Logged in Since 1	7.11.2010 20	:59:31				
Message List						
Date 🗸	Туре	Message		ID	Source	
2010-11-17 20:59:2	27 T	User 'hydro' (ID=6) conn	ected to instance 1	2012	HYDROMAP	SERVER
						11

#### SWITCH ON THE MULTIBEAM

System > Switch power



Close and confirm then wait... it takes some time for the system to start.

When the system is started you get a message: "Echo sounder is switched on!" in the message list (Main window).

You can then Close the Switch power window.

You need to wait 5 minutes before proceeding further.

#### SETUP THE POSITIONING SYSTEM AND CONNECT TO THE ECHO SOUNDER

• If this is the first time you switch on the multibeam or if you wish to change the MINS System > Connect new Echo Sounder

onnect a	nd Discor	nnect —						
Ship	Drau	aht [ [	)raught l	Modifica	ation Date			
PST_MIN		13	7.11.201	0 20:21	1:04			
PST_MIN			7.11.201					
Ship	0.00	0.	2.11.201	0 21:37	7:59			
Eaba Ca	under [	Driver	Pomar	ko				
CCHO SU		Diivei	Fielda	1.5				
							Connect	
							Connoor	
						Ę	)isconnect	
			<					
		12320732		0.000	HYDROMAP	CONTR	OL Instances –	
		ounders Driver	from All	ATLAS Ship	HYDROMAP Control Set			
		12320732		0.000	<u></u>	CONTR	OL Instances –	
		12320732		0.000	<u></u>	CONTR	OL Instances –	
		12320732		0.000	<u></u>	CONTR	OL Instances –	
		12320732		0.000	<u></u>	CONTR	OL Instances –	
		12320732		0.000	<u></u>	CONTR	OL Instances –	
		12320732		0.000	<u></u>	CONTR	OL Instances –	
onnectec Echo So		12320732		0.000	<u></u>	CONTR	OL Instances –	
		12320732		0.000	<u></u>	CONTR Host	OL Instances –	

Choose MINS (1 or 2)

- 1. Select the MINS on the upper field
- 2. Select it again on the middle field
- 3. Click Connect
- 4. Close

• If you're just connecting again during the same cruise

System > Connect Echo Sounder or



	_				
Presentation System					
] n   🗘	F 17	P 🖳 🎫 🛛	🦦 🛛 🕍 🖉		
cho Sounder Control			Measurement D		_
		lov 21:17:55 2010	Data Set Time	Mi 17. Nov 21:17:55 201	0
	is conne	6_MINS1	Data Set Age		0 [s
Connection State	Is conne	scied	Depth	, 	[r
				,	p
			Water Sound	Velocity	
ransmission State		STOP	C-Keel	1500.00	[m/s]
Tarismission State			C-Mean	1500.00	[m/s]
	Mi 17. N	lov 21:17:55 2010			
	12 10 10 10 10 10 10 10 10 10 10 10 10 10	HYDROSWEEP	-Motion Data-		
	STAND	BY	Heave	-0.78	[m]
ensor Operation Stat	BES MBES		Roll	0.82	[deg]
			Pitch	0.05	[deg]
					Ided
			Filler	0.00	
Deration Mode	STAND	BY .			
)peration Mode	STAND	BY _	- Ship's Data		
)peration Mode	STAND	BY _		11.20 [m]	
	STAND	BY _	- Ship's Data		
lser	•	BY	- Ship's Data		
	•	BY	- Ship's Data		
lser	0		- Ship's Data		
lser Jser Name hyd	0		- Ship's Data		
lser Jser Name hyd	0		- Ship's Data		
Iser Jser Name hyd .ogged in Since 17.	0	59:31 Message	Ship's Data Draught	11.20 [m]	
Iser JserName [hyd .ogged in Since [17: 1essage List Date ⊽ [ 2010-11-17 21:13:31	о 1.2010 20:5 Туре Т	59:31 Message Connected user 'h	Ship's Data Draught	11.20 [m]	
Jser Jser Name   hyd .ogged in Since   17. fessage List Date ∇   2010-11-17 21:13:31 2010-11-17 21:11:05	о 1.2010 20:5 Туре Т	59:31 Message Connected user 'h Disconnect user 'h	Ship's Data Draught ydro', host 'MCPCID53' ydro', host 'MCPCID53'	[m]	11' sc NS1'
Jser Jser Name   hyd .ogged in Since   17. fessage List Date \[\not\] 2010-11.17 21.13.13 2010-11.17 21.11.05 2010-11.17 21.07.08	о 1.2010 20:5 Туре Т Т	59:31 Message Connected user 'h Disconnect user 'h Connected user 'h	ydro', host 'MCPC1DS3' ydro', host 'MCPC1DS3' ydro', host MCPC1DS3'	11.20 [m]	11' sc NS1'
Iser Jser Name  hyd .ogged in Since  17. fessage List Date √   2010-11-17 21:13:31 2010-11-17 21:107:08 2010-11-17 21:07:08 2010-11-17 21:05:37	o 1.2010 20:5 Type T T T T	59:31 Message Connected user 'h Disconnect user 'h Connected user 'h Connected user 'h	Ship's Data Draught ydro', host MCPCID53' ydro', host MCPCID53' ydro', host MCPCID53' ady for Connect.	[m]	11' sc NS1'
Iser Jser Name hyd .ogged in Since 17. 4essage List Date ∑ 2010-11-17 21:11:05 2010-11-17 21:05:03 2010-11-17 21:05:34	о 1.2010 20:5 Туре Т Т Т Т Т	59:31 Message Connected user 'h Disconnect user 'h Connected user 'h Echo Sounder Re SPM Recovery Su	ydro', host MCPC1DS3' ydro', host MCPC1DS3' ydro', host MCPC1DS3' ady for Connect. cccessful.	[m]	11' sc NS1'
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Iser Jser Name hyd .ogged in Since 177: tessage List Date √ 2010-11-17 21:13:31 2010-11-17 21:107:08 2010-11-17 21:05:37 2010-11-17 21:05:34 2010-11-17 21:05:25 2010-11-17 21:05:22	o 1.2010 20:5 Type T T T T T T T T	59:31 Message Connected user 'h Disconnect user 'h Connected user 'h Echo Sounder Re- SPM Recovery SL SPM Recovery SL Driver 'ATLAS HY HVPM Hardware N	ydro', host 'MCPC1DS3' ydro', host 'MCPC1DS3' ydro', host 'MCPC1DS3' ydro', host 'MCPC1DS3 ydro', host 'MCPC1DS3 ady for Connect. iccessful. arted. >ROW/EEP DS-3' is ser /ersion: 1.0. Software V/	client(1) to ship 'PST_MINS ' client(1) from ship 'PST_MI client(1) to ship 'PST_MI client(1) to ship 'PST_MINS	11'sc NS1' 11'sc

PIGGING

#### PARAMETERS

You must set your pinging parameters depending on the depths you intend to work in:

System > Control Echo Sounder or 鸟

Templates are available for different working depths (MBES = MultiBeam Echo Sounder):

🔩 Control ATLAS HYDROSWEEP DS Sensor - Client 1 - PST_HS_MINS	51 _ 🗆 🗙
Operation Applied Data Sounder Environment Basic Settings	Advanced Settings Save/Load
Operation     Applied Data     Sounder Environment     Basic Settings       - Sensor Control Parameter Sets       Stored Sets       MBES_1000_2000       MBES_200_10000       MBES_500_1000       MBES_Shallow       rolf2       rolf3       VXVM       VXVM       VXVM       PSBP-MBES_Template       MBES_Template       MBES_Template       MBES_Template	Content of Selected Set Save  Content of Selected Set Save  Benove  Benove  Benove  Benove  Content of Selected Set  Benove  Benove  Benove  Content  Benove  Content  Benove  Content  Benove  Content  Benove  Benove Benove  Benove  Benove Beno
	nt Sensor Control Parameter Sets ication State
Help	<u>Apply</u>

Here are the recommended parameters:

Working depth	Template	Pulse rate
20-50m	MBES_shallow	0.8ms
50-200m	MBES_50_200	1ms
200-500m	MBES_200_500	3ms
500-1000m	MBES_500_1000	5ms
1000-2000m	MBES_1000_2000	10ms
2000-10000m	MBES_2000_10000	15ms

Pulse rate: never below 0,8ms!!! Never over 15ms!!!

We recommend you to use these templates (Load then Apply then OK).

These templates aren't protected so you can change the parameters within them. If you wish to do so please rename the template you are changing (New Set Name) so that the original templates will always be available for the future users.

The parameters you are most likely to change are the min and max depths and the pulse length (see screenshots in the appendix).

#### START THE PIGGING

#### Then you can start the transmission:

Operation mode > Sounding

Operation Mode	STANDBY	-
	STANDBY	
	SOUNDING	
	TEST	

This step is also necessary if you changed the parameters described on the previous page during the sounding. In this case, the system goes into "Standby" automatically and you need to set the operation mode back to sounding.

Now everything is running and you should get a similar display:

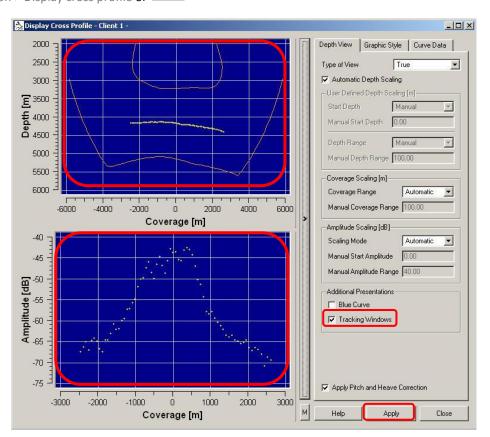
1927 (A. 1927)	1	DS Sensor - Client 1 -	PST_HS_MINS1		
Presentation Sys	-				
] 🕅 ] 👸 ]	1	🤌 🖳 📑 🛛 🍕			
Echo Sounder Contro	d		-Measurement Da	ata	
	123333790333	Nov 21:32:24 2010	Data Set Time	Mi 17. Nov 21:32:24 201	ō
Connection State	IPSI_H is conn	IS_MINS1 ected	Data Set Age		0 [s
Sonnocalon oraco			Depth	5099	.38 (n
			-Water Sound	Velocity	-
			C-Keel	1526.40	[m/s]
Transmission State		RUN	C-Mean	1500.00	[m/s]
		Nov 21:32:24 2010	-Motion Data-		
	SOUNI	HYDROSWEEP	Heave	0.28	[m]
Sensor Operation Sta	MODE				
			Roll	0.52	[deg]
			Pitch	0.40	[deg]
Operation Mode	SOUN	DING 🗾	Ship's Data		
Operation Mode	I Istouni	DING	Ship's Data Draught	11.20 [m]	
Operation Mode	I ISOUN	DING	a series and the series of the	11.20 [m]	
Dperation Mode		DING	a series and the series of the	11.20 [m]	
		DING	a series and the series of the	11.20 [m]	
Jser	dro		a series and the series of the	11.20 [m]	
Jser User Name hy Logged in Since 17	dro		a series and the series of the	11.20 [m]	
Jser User Name hy	dro .11.2010 20:	.59.31	a series and the series of the	[m]	
Jser User Name hy Logged in Since 177 Message List	dro .11.2010 20:	59.31 Message		[	40] -
Jser UserName hy Logged in Since 177 Message List Date ▽	dro .11.2010 20: 	-59:31 Message HVPM Status Message	E: PM: Actual voltag		200
Jser User Name My Logged in Since 177 Message List Date ⊽ 2010-11-17 21:31:34	dro .11.2010 20: 	-59:31 Message HVPM Status Message HVPM Status Message	E: PM: Actual voltag	e[111] < (voltageToHvpm[1	0] - \
Jser User Name hy Logged in Since 177 Message List Date ⊽ 2010-11-17 21:31:34 2010-11-17 21:31:34	dro .11.2010 20: 	59:31 Message HVPM Status Messagr HVPM Status Messagr HVPM Status Messagr	2: PM: Actual voltag 2: PM: Actual voltag 2: PM: Actual voltag 2: PM: Actual voltag	e[111] < (voltageToHvpm[1 e[96] < (voltageToHvpm[1	0] • \ 0] • \
Jser User Name hy Logged in Since 17 Message List Date 2010-11-17 21:31:33 2010-11-17 21:31:33 2010-11-17 21:31:33	dro .:11.2010 20: 	59:31 Message HVPM Status Message HVPM Status Message HVPM Status Message HVPM Status Message	E: PM: Actual voltag Actual voltag PM: Actual voltag PM: Actual voltag PM: Actual voltag	e[111] < (voltageToHvpm[1 [96] < (voltageToHvpm[1 [95] < (voltageToHvpm[14	0] - \ 0] - \ 0] - \
Jser User Name My Logged in Since 177 Message List Date ⊽ 2010-11-17 21:31:33 2010-11-17 21:31:33 2010-11-17 21:31:33	dro (11.2010 20: Type 4T 3T 2T 2T	59.31 Message HVPM Status Message HVPM Status Message HVPM Status Message HVPM Status Message HVPM Status Message	E: PM: Actual voltag a: PM: Actual voltag b: PM: Actual voltag c: PM: Actual voltag c: PM: Actual voltag c: PM: Actual voltag	e[111] < (voltageToHvpm[1 e[96] < (voltageToHvpm[1 e[96] < (voltageToHvpm[1 e[95] < (voltageToHvpm[1 e[79] < (voltageToHvpm[1	0] - \ 0] - \ 0] - \ 0] - \
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Jser User Name hy Logged in Since 177 Message List Date 2010-11-17 21:31:33 2010-11-17 21:31:33 2010-11-17 21:31:33 2010-11-17 21:31:33 2010-11-17 21:31:30 2010-11-17 21:31:00 2010-11-17 21:32:57	dro .11.2010 20: .11.2010 20:	59:31 Message HVPM Status Message HVPM Status Message HVPM Status Message HVPM Status Message HVPM Status Message Transmission Mode for Updated Control Data	2: PM: Actual voltag 2: PM: Actual voltag 5: Ounder PST_HS_ Set 'MBES_2' for so	e[111] < (voltageToHvpm[1 [96] < (voltageToHvpm[1 e[95] < (voltageToHvpm[1 e[95] < (voltageToHvpm[1 e[62] < (voltageToHvpm[1 e[45] < (voltageToHvpm[1 e[45] < (voltageToHvpm[1 ullNS1'changed to SOUN] under type 'ATLAS HYDRO	0] - \ 0] - \ 0] - \ 0] - \ 0] - \ 0] - \ DINE WEE
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#### CONTROL

#### CHECK THE SIGNAL

#### Check that the sounding really has started:

Presentation > Display cross profile or



Check if there is a signal (yellow dots). It will take about 10 pings until the profiles are displayed.

Turn on the tracking window then Apply. The tracking window is drawn as two orange lines (nose and chin of the 'face' you can see on the upper window). It represents the region where the signal is expected. The signal should lie between those lines. If not then your template might be wrong (min max depths....)

#### Special case for shallow water

When you are working in shallow water, you will have the tendency to increase the coverage (swath width) in order to 'see' a bigger portion of the seafloor. In some cases you will have to adapt this swath width depending on the shape of the tracking window.

- If the upper line is U shaped (like above) then reduce the swath width
- If the upper line is really flat the increase the swath width

It is not recommended to change those parameters during the survey as it takes some time for the program to recalculate the parameters.

#### SENSOR STATUS

Another display is important to check that everything is running well:

Presentation > Display Sensor Status

Display Sensor !	Status - Client 1 -	
Position		
Date/Time	Mi 17. Nov 21:15:05 2010	🗌 🔲 Alarm
Latitude/Longitude	013° 55.109' S ° 003	3° 43.739' W 🏾 °
Heading		
Date/Time	Mi 17. Nov 21:15:06 2010	🗌 🔽 Alarm
Heading	130.5 °	
Motion	- 18	
Date/Time	Mi 17. Nov 21:15:06 2010	📕 📕 Alarm
Heave/Roll/Pitch	0.2 m 0.3 °	-0.1 °
CKeel		
Date/Time	Mi 17. Nov 21:15:05 2010	🗌 🔽 Alarm
CKeel	1500.0 m/s f	rom ckeel
Alarm Output		
C Acoustic	📕 Message Box	¢
Position	Heading Motion	CKeel
Help		Close

Position, Heading, Motion and CKeel must be green!

You can then move all Atlas Hydromap Control windows to the left screen so you can always control if the soundings are going on.

#### ATLAS SENSOR MANAGER: INTEGRATING THE SVP TO ATLAS HYDROMAP CONTROL

This section is extremely important if you intend to read the exact depth under the ship. If you need a very precise measurement you definitely need to integrate a sound velocity profile of the area into the program. This profile needs to go down to the seafloor and the integration works better with a reduced number of data point!! We highly recommend you to refer to the Data Cleaning section in the SVP chapter.

• If you don't need to display the depth along your track but only check it under the ship, you can use only Atlas Hydromap Control, no need to use Hypack. Parasound is even better for this purpose but goes beyond the scope of this guide (ask the ship technician if he can help).

	- II 🎤 🖳 🧾 🔇	»		
Echo Sounder Control —		Measurement D	ata	
	Mi 17. Nov 21:32:24 2010	Data Set Time	Mi 17. Nov 21:32:24 201	Ō
Connection State	PST_HS_MINS1 is connected	Data Set Age		0
		Depth	5099	9.38
		-Water Sound	Velocity	2.11
ransmission State	BUN	C-Keel	1526.40	[m/s
ransmission State	J HUN	C-Mean	1500.00	[m/s
	Mi 17. Nov 21:32:24 2010 ATLAS HYDROSWEEP	Motion Data		
	SOUNDING	Heave	0.28	[m]
ensor Operation State	MBES	Roll	0.52	[deg
		Pitch	0.40	[deg

• If you intend to record and display your data in Hypack then you will anyway integrate the SVP in Hypack but having it also in Atlas Hydromap Control doesn't hurt.

We recommend you to integrate the SVP to Atlas Hydromap Control in any case.

For this you will have to use Atlas Sensor Manager (The multibeam must already be running as described in the previous pages).

System > Select Sensors

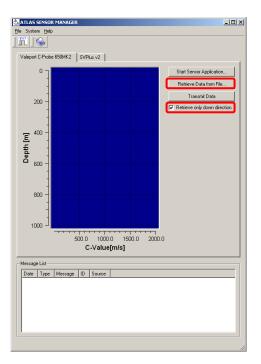
Available Sensors	Sensor Application	ID		<u>0</u> K
Z Valeport C-Probe 650MK2	No Application	4		_
SIS C-Probe CTD-60	No Application	5		<u>C</u> ancel
C-Probe SVP-20	No Application	6	1	
FSI CTD 3Micro	No Application	7		Help
🗌 Sippican XBT MK-21	No Application	8		
Valeport Tide M740	No Application	9		
BSH KOMET CTD-Probe	No Application	10		
SVPlus v2	No Application	11		
Generic SVP	No Application	12		
Valeport 606CTD	No Application	13		
🗹 Sea Bird SBE9	No Application	14	-	

Choose your instrument:

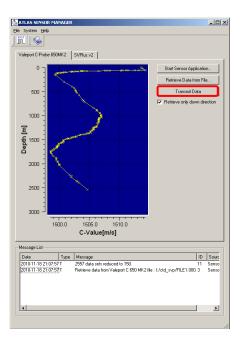
- Original CTD profile containing sound velocity (.cnv) = Sea Bird SBE9
- Original Valeport SVP profile (.000) = Valeport C-Probe
- File prepared in svp.exe (Hydromap Online format) = Generic SVP (for textfiles)

Atlas Sensor Manager might have difficulties reading formats from the CTD. We recommend you to clean and extend your data in svp.exe prior to the export as described in the SVP chapter.

Check the Retrieve only down direction box



Then click Retrieve data from file and choose your file. The chosen profile should appear in the window.



You can then click Transmit data. The SVP is now integrated to Atlas Hydromap Control (for both Hydrosweep and Parasound) and taken into account for the water depth calculation. You can now close Atlas Sensor Manager.

#### STOPPING THE SYSTEM

#### There are precautions to take to stop the multibeam from pigging.

#### In Atlas Hydromap Control

Do NOT disconnect!!!! This would cause several troubles in the system.

#### Instead:

1. Operation mode> standby

Operation Mode	STANDBY	
	STANDBY	
	SOUNDING	
	TEST	

2. System>Switch power

ATLAS HYDROSWEEP DS	-
ON	
Update Power Status	1
0N Transmission Inhibit OFF	

Close and confirm.

The windows should look like this:



		I. DS Sensor - Client 1 -
System Extra		
] H   C	<u>ا امالا</u>	s se
Cho Sounder Co	introl	Measurement Data
		Data Set Time
Connection State		Data Set Age
Lonnection State		
		Depth [
		Water Sound Velocity
		C-Mean (m/s)
Transmission Stal	te 📃	STOP
	_	
		Ship's Data
Sensor Operation	State	Draught [m]
Jser		
Jser	[hydro	
User Name		
		531.41
User Name		531.41
User Name Logged in Since Viessage List Date 💎	22.11.2010 1	Message
User Name Logged in Since Message List Date 2010-11-22 20:0	22.11.2010 1	Message Echo Sounder is switched offi Please wait 2 minutes until shutdown procedu-
User Name Logged in Since Message List Date 2010-11-22 20:0 2010-11-22 20:0	22.11.2010 1 Type 12.13T 12.13T	Message
User Name Logged in Since Message List Date 2010-11-22 20:0 2010-11-22 20:0 2010-11-22 20:0	22.11.2010 1 Type 12.13T 12.13T 12.13T 12.10T	Message Echo Sounder is switched off Please wait 2 minutes until shutdown procedu Echo Sounder is switched off Please wait 2 minutes until shutdown procedu Disconnect user tydoy, host MCCIOS dereit] (host host por ST_MINIST: w
User Name Logged in Since Message List Date 2010-11-22 20:0 2010-11-22 20:0 2010-11-22 20:0 2010-11-22 20:0	22.11.2010 1 Type 12.13T 12.13T 12.10T 12.09T	Message – – – – – – – – – – – – – – – – – – –
User Name Logged in Since Vessage List Date 2010-11-22 20.0 2010-11-22 20.0 2010-11-22 20.0 2010-11-22 20.0 2010-11-22 20.0	22.11.2010 1 Type 2.13T 2.13T 2.13T 2.10T 2.09T 2.03T	Message Echo Sounder is switched off Please wait 2 minutes until shutdown procedu- Echo Sounder is switched off Please wait 2 minutes until shutdown procedu Disconnect use thiched off Please wait 2003 dient[] (Inno 1975 J. MINST in Transmission Mode for Sounder PST J.H.S. MINST charged to UNDEFINED Echo Sounder is workhoed on Please wait Smutes until stratup procedue to subhes witched on Please wait Smutes until stratup procedue to
User Name Logged in Since Message List Date ∇ 2010-11-22 20.0 2010-11-22 20.0 2010-11-22 20.0 2010-11-22 20.0 2010-11-22 20.0 2010-11-22 20.0	22.11.2010 1 Type 2.13T 2.13T 2.13T 2.13T 2.10T 2.09T 2.03T 2.03T	Message Echo Sounder is switched off! Please wait 2 minutes until shutdown procedu Echo Sounder is switched off! Please wait 2 minutes until shutdown procedu Echo Sounder is switched off! Please wait 2 minutes until shutdown procedu Taramaisian Medio Fo Sounder PS-146, MINST 1 heapto UNDEFINED Echo Sounder is switched on Please wait 5 minutes until statup procedure 1 Echo Sounder is waitched on Please wait 5 minutes until statup procedure 1
User Name Logged in Since Message List 2010-11-22 20:0 2010-11-22 20:0 2010-11-22 20:0 2010-11-22 20:0 2010-11-22 20:0 2010-11-22 20:0 2010-11-22 20:0	22.11.2010 1 22.13 T 12.13 T 12.13 T 12.13 T 12.10 T 12.09 T 12.03 T 12.03 T 12.03 T 11.57 T	Message Echo Sounder is entitled off Please web 2 minutes und shutdown procedu- Echo Sounder is entitleded III Please web 2 minutes und shutdown procedu- Discovence user breach. Intel MCPOS2 citent() from the PS1_MINS1's Transmission Mode to Sounder PS1_HS_MINS1's charged to UNDEFINED Echo Sounder is switched on Please web 5 minutes und stetup procedure 1 Echo Sounder is switched on Please web 5 minutes und stetup procedure 1 Transmission Mode to Sounder PS1_HS_MINS1's charged to STANDEP
User Name Logged in Since Vessage List 2010-11-22 20.0 2010-11-22 20.0 2010-11-22 20.0 2010-11-22 20.0 2010-11-22 20.0 2010-11-22 20.0 2010-11-22 20.0 2010-11-22 20.0	22.11.2010 1 22.13 T 213 T 213 T 210 T 209 T 209 T 203 T 1.57 T 4:23 T	Message Echo Sounder is switched off! Please wait 2 minutes until stutidown procedu- Echo Sounder is switched off! Please wait 2 minutes until stutidown procedu- Echo Sounder is switched off! Please wait 2 minutes until stutidown procedur Taramanian Mode for Sounder PF1, Hol. MIST 1 heaptod UNDEFIPED Echo Sounder is switched on Please wait 5 minutes until statup procedure 1 Echo Sounder is switched on Please wait 5 minutes until statup procedure Taramanian Mode for Sounder PF3, Ho. MIST 1 heaptod to STADDBY HVPH Statu Message. PHA. Aduat Valegit(S) (cholged forkgr) (140) - ethol
User Name Logged in Since Message List Date ∑2010-11-22 200 2010-11-22 200 2010-11-22 200 2010-11-22 200 2010-11-22 200 2010-11-22 200 2010-11-22 184 2010-11-22 184	22.11.2010 1 22.13 22.03 22.03 22.03 22.03 22.03 22.03 22.03 22.03 22.03 22.03 22.03 22.03 22.23 22	Message = Echo Sounder is switched off Please wait 2 minutes until shutdown procedu- Echo Sounder is switched off Please wait 2 minutes until shutdown procedu- Echo Sounder is switched off Please wait 2 minutes until shutdown procedu- Echo Sounder is switched of Please waits fruits-until a shutdown procedure Echo Sounder is switched on Please wait 5 minutes until shutp procedure Echo Sounder is switched on Please wait 5 minutes undi shutp procedure Echo Sounder is switched on Please wait 5 minutes undi shutp procedure Echo Sounder is switched on Please wait 5 minutes undi shutp procedure HVPM Status Message PM. Actual voltage[310] ( voltage] of VorpT410- vol HVPM Status Message PM. Actual voltage[310] ( voltage] of VorpT410- vol
User Name Logged in Since Message List 2010-11-22 20:0 2010-11-22 20:0 2010-11-22 20:0 2010-11-22 20:0 2010-11-22 20:0 2010-11-22 20:0 2010-11-22 18:4 2010-11-22 18:4	22.11.2010 1 22.11.2010 1 21.3T 21.3T 21.3T 21.0T 20.9T 20.9T 20.9T 20.9T 20.9T 20.9T 2.03T 4.23T 4.23T 4.22T	Message Echo Sounder is switched off! Please wait 2 minutes until shutdown procedu- Echo Sounder is switched off! Please wait 2 minutes until shutdown procedu- Echo Sounder is switched off! Please wait 2 minutes until shutdown procedu- Taranmision Mode for Sounder PST_HS_MINST (heaped to UNDEFILED Echo Sounder is switched on Please wait 5 minutes until statup procedure 1 Echo Sounder is switched on Please wait 5 minutes until statup procedure Taranmision Mode for Sounder PST_HS_MINST (heaped to STADDBY HVMS Statu Message PM: Actual valegis(5) (volges) of Hvgn[14]) - w HVMS Statu Message PM: Actual valegis(1) (volges) of Hvgn[14]) - w HVMS Statu Message PM: Actual valegis(1) (volges) of Hvgn[14]) - w
User Name Logged in Since Message List Date ∑2010-11-22 200 2010-11-22 200 2010-11-22 200 2010-11-22 200 2010-11-22 200 2010-11-22 200 2010-11-22 184 2010-11-22 184	22.11.2010 1 22.11.2010 1 21.3T 21.3T 21.3T 21.0T 20.9T 20.9T 20.9T 20.9T 20.9T 20.9T 2.03T 4.23T 4.23T 4.22T	Message = Echo Sounder is switched off Please wait 2 minutes until shutdown procedu- Echo Sounder is switched off Please wait 2 minutes until shutdown procedu- Echo Sounder is switched off Please wait 2 minutes until shutdown procedu- Echo Sounder is switched of Please waits fruits-until a shutdown procedure Echo Sounder is switched on Please wait 5 minutes until shutp procedure Echo Sounder is switched on Please wait 5 minutes undi shutp procedure Echo Sounder is switched on Please wait 5 minutes undi shutp procedure Echo Sounder is switched on Please wait 5 minutes undi shutp procedure HVPM Status Message PM. Actual voltage[310] ( voltage] of VorpT410- vol HVPM Status Message PM. Actual voltage[310] ( voltage] of VorpT410- vol

#### HYPACK: MAP OF THE SEAFLOOR

#### START YOUR WORK IN HYPACK

The data can be displayed and recorded in real time in Hypack. Start Hypack

) 🖯 🥥 🔓 🔂 🖓 • 🤞	Grid	Ellipsoid: WGS-84	Zone	Dist Unit: Meter			
File     Fav Data File     Edded Data File     Sorted Data Files	-2 00000 × 000 Y	-1800000 X	-1600000 X	-1400000 X	-1200000 X	-1000000 X	**************************************
ct Files Advanced Channel Files Background Files Background Files Channel Plan Files Channel Plan Files Channel Plan Files	T. 200 Y						600000 Y
Plotting Sheet Files     Plotting Sheet Files     Sound Velocity Files     Target Files     Target Files     Tarfet Files     Bucket Files     Adop Files	400000 Y						400000 Y
ves	200000 Y						200000 Y
	1.00000	X 00000	-160000 X	× 0000	X 00000 X	X 000000	× 0000008

You need to create a project where all your data and settings will be saved. For this you have two options: either creating a completely new project or copying an existing project (especially recommended when measuring in the same area)).

#### CREATE A NEW PROJECT

File > Project manager

Project Folders Help	
Name	Access
projekt_test PST PST4 PST_2 PST_2 test test2	Nov 02, 2010 Nov 03, 2010 Nov 13, 2010 Nov 05, 2010 Nov 05, 2010 Nov 05, 2010 Nov 10, 2010
Open Project	Copy Project
Open Project New Project	Copy Project
New Project	
New Project	Delete Project

Choose your saving folder

> New project: you must name your project

Cancel

Please include your cruise id to your projects names. Example: ant27-1\_project1

(The projects in the screenshot are test projects and do not fulfill these specifications)

When you create a new project, parameters are either copied from the last project or set to default:

Default parameters:

Display

Parameters copied from the LAST project:

- Geodesy
- Boat hardware configuration
- Survey program parameters

Parameters NOT copied from the LAST project:

- Planned lines
- Background data
- Matrices
- Target files
- Data files

#### COPY AN EXISTING PROJECT

You can also copy an existing project to import its parameters.

File > Project manager

Project Manager [G:\H Project Folders Help	lypack_Projekts]
Name	Access
projekt_test PST PST4 PST_2 test test2	Nov 02, 2010 Nov 03, 2010 Nov 03, 2010 Nov 05, 2010 Nov 05, 2010 Nov 05, 2010 Nov 10, 2010
Open Project	Copy Project
New Project	Delete Project
View L	ocal Projects
7	k Projecte
View Networ	

Choose the project folder from which you wish to copy a project You should save your project in G:\Hypack\_projects (Network Projects)

#### Select an existing project

> Copy project: you must name your project

		-		
ew F	Project Nam	e		
		OK	Cancel	1

Please include your cruise id to your projects names. Example: ant27-1\_project1

(The projects in the screenshot are test projects and do not fulfill these specifications)

Parameters copied from the SELECTED project:

- Geodesy
- Boat hardware configuration
- Survey program parameters
- Planned lines
- Background data
- Matrices
- Target files
- Display settings

Parameters NOT copied from the SELECTED project:

• Data files

#### HYPACK: POSITIONING AND BACKGROUND

## INTEGRATE HYDROSWEEP AND GPS DATA

You have to describe the devices you are recording data from:

Preparation > Hypack Hardware

#### Check if the settings are as follow:

File Edit Options Help	
Add Device Add Mobile	Device
Boat Boat GFS NMEA-0183 with RTK Tide	Functions         Position         Depth         Heading         Speed         Tide         Vertical 0.00 m         Vertical 0.00 m         Proward         Options         Vertical Postive Downward         Latency       0.000 sec.         Precord raw messages         Precord device specific messages         Connect       Serial Port         Setup       Test         Mobile Assignment       Data bits       % Stop bits         Installed on       Boat       1         Parity       None       Flow Control None
File Edit Options Help Add Device Add Mobile	Driver gps.dll Device Functions Consection Definets
GPS NMEA-0183 with RTK Tide	Openth       Meeding         Heading       Starboard       0.00       m       Yaw       0.00       deg.         Forward       0.00       m       Roll       0.00       deg.         Vertical       0.00       m       Pitch       0.00       deg.         Options       Latency       0.000       sec.         Use for matrix update       Connect       None       T
	Setup Test Mobile Assignment Installed on Boat Driver hysweep.dll

#### SETUP THE MINS

The correct MINS must also be selected in Hypack because there are some correction parameters to apply. Hysweep > Hysweep Hardware

#### File > Open

In the folder Installation select MINS1.ini or MINS2.ini depending on the MINS used.

Select Atlas Hydrosweep DS and go to Offsets to check that the parameters are loaded.

Manufacturer / Model		Installed	
Analog Sidescan Applanix POS/MV Network	Add	Hupack Navigation Atlas Hydrosweep DS	
Applanix POS/MV Network Applanix POS/MV Serial Atlas Bomasweep Atlas Fansweep Atlas Fansweep (Serial)	< Rem		
Allas Hydrosweep DS Allas Hydrosweep MD/30 Allas Hydrosweep MD/50 Allas Hydrosweep MD2 Benthos 162X Benthos 162X Benthos C30 BlueView Multibeam C-MAX CM2 C-MAX CM2 C-	Setup.		
Specific Sonar Identification Atlas Hydrosweep DS	-		

Parameters for MINS1 as calibrated in November 2010:

n
)evice Rotation from Forward (Yaw) and Vertical nd Pitch) tation follows azimuth (clockwise rotation is
<ol> <li>Bow up is positive pitch, port side up is positiv</li> </ol>
0.00
0.00
91

Parameters for MINS 2 as calibrated in November 2010:

Starboard	-3.18	
Forward	22.72	
Vertical	11.82	

For both MINS 1 and 2: the Yaw, Pitch and Roll angle are already applied in Atlas Hydromap Control and must be set to zero in Hypack.

You can then close and save your parameters.

#### CONFIGURE THE GEODETIC PARAMETERS

Hypack only records projected coordinates (what you would have on a map, distance units), no geographic coordinates (what you get from the GPS, angle units). You have to set the geodetic parameters, i.e. the geometric transformation you use to draw what is on a sphere onto a plane.

There are projections adapted for each region of the world but we recommend you to use the Mercator projection with Greenwich  $(0^{\circ}0'0')$  as central meridian. This projection is known to most software and we have decided to use it for all our datasets (except for the Arctic where it is not applicable).

Preparation > geodesy

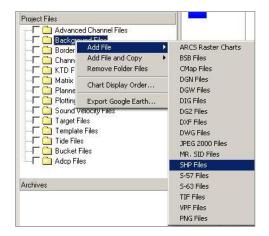
🔧 Hypack - Geodetic parameters	?  X
Datei Optionen Hilfe	
Predefined Gitter none 💌 Zone	Projektion Mercator
Distance Unit Meter	
Depth Unit same as horizonta	False Easting (X)         0.0000           False Northing (Y)         0.0000
Elevation Mode (Z-axis positive going up)	Datum transformation parameters
Ellipsoid WGS-84	Delta Y         0.00         Delta Y         0.00000
Große Halbachse 6378137.000	Delta Z 0.000 Delta iZ 0.00000 Delta Scale 0.00000 Calculate
Flattening (1/f) 298.257223563	Datum shift file
Geoid Model X	Local Grid Adjustment     Local Grid     Chart datum level above geoid     0.00
OK	Abbrechen

Take extra care that the false easting should be set to 0 as it is wrong in some older projects.

There you can also setup the distance units you want to use (meters or feet).

#### ADD BACKGROUND CHARTS AND DATA

You can add background layers in Hypack to help you planning and following your measurements. In the Hypack administration window, right click on Background files (File arborescence left of the map).



Select your file type and then the file you want to open.

Background files must be either in the same projection as your project or in geographic coordinates (WGS-84).

Layouts available on mcpc1ds3: in Data(G) > Backgrounds

File	Description	Format	Reference system
Continent	World coastlines	.shp (ArcGIS shape)	WGS-84

More layouts might be added later on.

#### PLANNING A SURVEY

#### PLAN THE TRANSECTS

If you just intend to visualize what is under the ship you can go directly to the next point. But if you want to map a certain part of the seafloor you have to plan your transect.

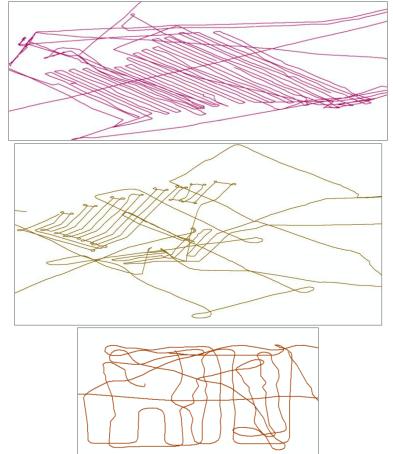
Most of the time you don't know what to expect so you'll have to adapt to what is appearing on your screen. The main difficulty to overcome is the variation in the coverage width with depth (the shallower the depth, the narrower the portion of seafloor which you can map).

Important information:

- You can calculate that the portion of seafloor covered by the multibeam is twice the water depth.
- You don't need overlapping.
- Ship time is expensive, so you can map at the speed of 10 knots, the ship speed is no issue.
- Constant communication with the bridge about the feasibility of your survey is extremely important.
- Small gaps can be filled in by interpolation

Recommendations:

- Get a first idea of the depth by covering the whole area with a large distance between two tracks.
- Plan the following tracks according to what you've observed: try to follow contour lines.
- Here some examples of past surveys



• Everything depends on the time you have, if you want to precisely plan a trajectory and calculate how much time you need to make it you can use a small program which allows you to estimate distances between points and time needed to cover the area: trackplaner.exe

ID Name	*Latitude	*Longitude	Dist. [nm]	Track [nm]	*S.[kn]	Time	-	違 Öffnen
1			-	0,0	=>	17.11.2010 14:32:13		Speich
2								🔆 Alle la
3								Zelle
4								Zelle En Kopiel
5								
6								
7								🗙 Lösch
8								Zeile
9								🍾 Zeile I
10								<u></u>
11								
12								C Updat
13								1
14								
15								
16								
17								
18								
19								
20							-	👖 S <u>c</u> hi

Enter your waypoints:

• Name: double click in the cell to enter the name of your point (no spacing) which makes it easier to identify on a map later on.

Wegpunkt-Nr. (keine Leerzeichen)				
0				
✓_ОК	_X Abbrechen			

• Latitude and longitude: double click in the cell to enter your coordinates (several units possible). Take care of negative values!!!

Winkel Eingabe	×
C Radiant	-0,00114668131856027
C Dezimalgrad	-0,0657
Grad Dezimalminuten	-0 : 3,942
🔘 Grad Minuten Sekunden	-0 : 3 : 57
<b>X</b> A	bbrechen 🗸 OK

- Distance (nautical miles) will be automatically calculated
- Track length (nautical miles) will be automatically calculated
- Speed (knots) can be given starting from the second point. This cell => allows you to allocate the same speed between all your points
- Time can be typed or set to the actual system time

Datum / Zeit		×
17.11.2010 💌	14:49:39	a
🗙 Abbrechen	🗸 ОК	

When you click on update, all the values are calculated.

You can then save your file as a text (.tpp), point or line shape (.shp to be opened in ArcGIS or in QGIS), as an html file or as a Hydromap Online/ Map (format than can be read on the bridge).

# REAL TIME VISUALISATION OF THE RECORDED DATA: CREATE A MATRIX

A matrix describes the size of the area you are planning to survey and the expected resolution (size of pixels). It allows getting an idea of the memory needed for the recorded data within the matrix (depending on the area covered and the cell size).

Don't exceed a file size of 150 Mb! (Split your matrix or increase the cell size!) The matrix only affects the display, the raw data aren't changed!!!

You can also draw your matrix after having started the survey in order to see your ship position but the data will only display within a matrix!!

Preparation > Editor > Matrix editor

1. Set the limits of the survey area: you can enter coordinates of the lower left corner and the size of the matrix or draw the area directly by modifying the green frame:

bottom left: move the matrix

bottom right: enlarge the matrix horizontally

**a**-

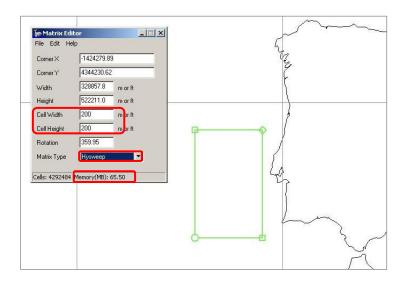
 $^{]}$  top left: enlarge the matrix vertically

🖄 top right: rotate the matrix

2. Set the pixel (cell) size Recommended cell sizes:

Depth	Cell Width	Cell Height
0-100m	5m	5m
100-500m	20m	20m
500-1000m	50m	50m
>1000m	100m	100m

3. Matrix type: Hysweep



File > Save

Save the file in your project folder. Then close the Matrix Editor.

If you want to change your matrix size during the survey you have to first unload the matrix, then modify your file and load it again.

### IMPORT A SOUND VELOCITY PROFILE IN HYPACK

You can include sound velocity profiles (SVP) to Hypack in order to increase the accuracy of the multibeam measurements. The steps described here allow you to import a SVP in Hypack, which is needed even if you integrated the SVP to Atlas Hydromap Control. There is another step to integrate the correction to the depth calculation. This one will be described in the following chapter "Conduct a survey" (Hysweep survey window).

The profile needs to go down to the seafloor and the integration works better with a reduced number of data point!! We highly recommend you to refer to the Data Cleaning section in the SVP chapter.

Processing > Sound velocity > Sound velocity

		Enter De	epth in Meters and Velo	ocity in M/Sec	
_	End Depth	Velocity		Sound Velocity v	s. Depth
			1 121		
Ŭ.					
1			- Ave	erage	0.00
	Delete Row	Insert Row	Swap Columns	Sort	,   Graph

You have two options to integrate an SVP profile depending on the file type:

- File > Open (.vel from svp.exe)
- File > import (Valeport .000 , ctd .cnv or .txt, .vel would also work)

Field	Accept	Skip Record	Field	Accept	Skip Reco
lodel		Accept Record	8	<b>N</b>	Accept Rec
ime			Sea-Bird	E	3
	<b>V</b>	Accept All	SBE		Accept A
DAS	<u> </u>		25		
/P			Data		
000			File:	<b>—</b>	
	<u>_</u>				
				<u> </u>	
Comma Separ	ated Fields		🖵 Comma Sepa	rated Fields	
- XBT		<u> </u>	⊢ ×bt		OK
Salinity (PPT)	35.0	Cancel	Salinity (PPT)	35.0	Cancel

Valeport

CTD

Select the columns containing the depth and the sound velocity (check in editor) then accept all and OK. The profile is drawn, you can still exclude data.

		Enter De	pth in Meters and Velo	city in M/Sec	
	End Depth	Velocity		Sound Velocity vs	. Depth
1	0.10	1538.40			ł
2	0.30	1538.60			}
3	0.40	1538.50			5
4	0.50	1538.60			A.
5	0.70	1538.60			hard
6	0.80	1538.60			5
7	1.00	1538.60			r.,
8	1.10	1538.60		1	
9	1.20	1538.60	70	~	
10	1.40	1538.60		1525	1540
11	1.50	1538.60	Ave	rage [	1535.85
	Delete Row	Insert Row	Swap Columns	Sort	Graph

Check that Depth is in the column on the left, SVP on the right, if not swap columns. You can sort the columns to check if there aren't any implausible values and delete those rows. You can also add data manually with insert row. The data must go to the sea bottom! Click graph to refresh the display.

Then File > Save for imported files or File> Save as for opened .vel files. Save your file in your project folder. You can then close the sound velocity window.

Check that the relevant (the latest or the nearest) .vel file (in SVP folder of your project) is active (checked in the file arborescence on the left of the map).

### CONDUCT A SURVEY

To start a survey: Survey > Survey and Hysweep survey Several windows open.

# SURVEY WINDOW



It contains the main commands for the survey.

### FILE NAMING

You file naming should match the AWI specifications: Expedition\_Year\_DayOfYearAndSystemTime\_XX.HSX

Example: ANT27-1\_2010\_3240915\_OA.HSX

Expedition id: ANT27-1: Expedition ANT (Antarctic), 27 (Expedition number), 1 (Track number) Year 2010 Day of year 324 (20<sup>th</sup> November) System time 0915 (09:15 am) Program own id OA File type .HSX

You can setup a prefix for your files' names:

Options > Project information (only works when not logging)

Project Data			×
Project	PST4		
Job		🗌 🗌 Override Pr	roject Path
Area		G:\Hypack_Pi	rojets\PST4
Boat		🗌 🔲 Override Ta	arget Path
Surveyor		G:\Hypack_Pi	rojets\PST4
C Standard	HYPACK Filenames		
💽 Long Filer	names		
C CHS Filer	names	🔽 Use File Prei	fix ANT27-1
🔿 Julian Daj	y as Extension	Append Julia	an Day to Prefix
C Other Ext	ension ext	OK	Cancel

Long filename will automatically add the year, day of year, system time, program own id and file type.

You just need to add the file prefix: you expedition id (here ANT27-1\_)

# FILE SIZE CONTROL

To avoid your files getting too big, you can set a time interval at which a new file should be created.

Options>Navigation parameters The Log Backup Time (minutes) can be set:

Start line gate ×TE Alarm limit Next event Event interval	0.00 0.00 2326 1000.00	Event basis C Manual C Time C Distance
Event increment Next Line Line increment LOG Backup Time	1	Automatic leg switch While logging Always Never
MTX Backup Time Seabed Sound Vel Min Depth Reset Events on B Time Events on B Connect Events	Even Intervals	Line Direction Mode Closest point Origin point Terminus point Alternate points

We recommend you to set it to 30 minutes for shallow water, 60 minutes for deep sea in order to get an acceptable file size.

### START/ STOP LOGGING

When the survey starts Hypack is still not logging (the End logging icon is grayed).

Logging	Line	Chart	Vessels	Matrix	Targets	Tide	Options	Window	Help
---------	------	-------	---------	--------	---------	------	---------	--------	------

You have to start the logging so that the program starts recording the data.

Logging > Start logging or

📷 Surve	ey								
Logging	Line	Chart	Vessels	Matrix	Targets	Tide	Options	Window	Help
11		20	Q <u>²</u> ∑	25 Ø	<u> </u>	<u>.</u>	4		

The End logging icon turns red.

If you want to start a new file:

Logging > Restart logging or

If you want to stop the logging (end file, wait before recording again or stop system):

Logging > End logging or

If you want to exit the program then stop the logging, exit the survey and exit Hypack (save your project in order to be able to visualize the data within your matrices later on).

### HYSWEEP SURVEY WINDOW

This window allows you to control if the main sensors are working and to setup additional parameters. The window title shows you the name of the file where data are being recorded (here ANT27-1\_2010\_3222216\_OB.HSX).

5154.03	Time (Event)	23:07:07 (2319)
0.00	Draft Corr	0.00
0.09	Roll	0.08
0.33	Heading	124.82
17 04 12.3202 S	Longitude	000 13 40.6042 E
1514.3	SV From SOnar	1525.9
1	D.00 D.09 D.33 17 04 12.3202 S	D.00 Draft Corr D.09 Roll D.33 Heading 17 04 12.3202 S Longitude

#### Nav, Gyro, MRU, Multibeam, Sidescan and Devices should be green.

Nevertheless it can happen that the connection to an instrument gets lost a short time. Do not panic if some turn red for some seconds, they are very likely to turn green again without you touching anything!!! If it lasts you might have to restart the program or turn the system off and on again.

You can also display additional windows:

View > Choose the windows you would like to add.

### INCLUDE A SOUND VELOCITY PROFILE IN HYSWEEP SURWEY

You need to add your sound velocity profile again in order to integrate it to your data (real time display). Corrections > Sound Velocity

You get a window very similar to the one for SVP in your project.

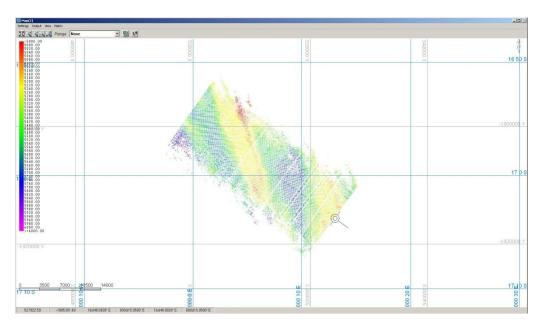
Import your SVP file (.vel, .000 or .cnv), check it and then click OK.

nvert							
_							
		Enter Depth	n in Met	ers and Velocity in	M/Sec		
	Depth	Velocity		S	ound Velocity	vs. Depth	-
1	1.0	1513.5		0	<		
2	3.2	1513.5			1		
3	7.0	1513.6				2	
4	9.0	1513.6			-		
5	19.9	1513.8			1 and the second		
6	25.8	1513.9			1		
7	27.8	1513.9			~		
8	38.7	1514.1			1		
9	41.6	1514.1		3120		~	
10	51.6	1514.3		1495			1515
11	52.6	1514.1	-	Average	F	1503.9	
0	elete Row	Insert Row		Graph		C	OK
Sv	vap Columns	Sort		Import			Cancel
	Clear All						

Your SVP is integrated to the calculation of your online data.

### MAP WINDOW

The map window displays a real time map of the portion of seafloor included in the matrix (and only in the matrix!!!) where you are recording.



The cursor : Prepresents the position and heading of your vessel.

# ADD GRID

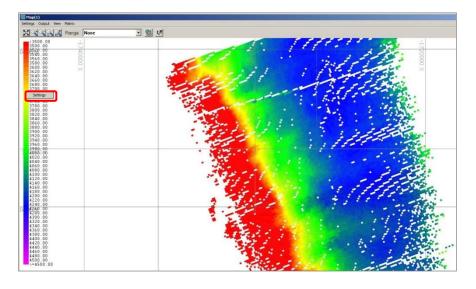
You can add a grid to the map:

Setting > Grid Properties

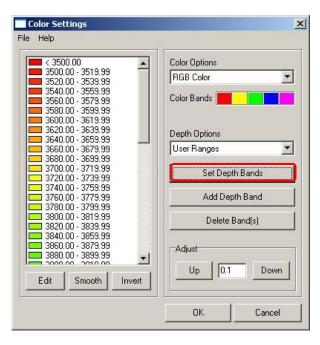
Grid Setup 🔀
✓ Lat/Lon Grid - Lat/Lon Options
Grid Spacing C Auto C Fixed 1000
Grid Style 💿 Lines 🔿 Tics
Label 🗖 Top 🔽 Bottom 🔽 Left 🔽 Right
Format O Deg 💿 Deg Min O Deg Min Sec
✓ XY Grid XY Options
Grid Spacing O Auto O Fixed 100
Grid Style 💿 Lines O Tics
Label 🔽 Top 🔽 Bottom 🔽 Left 🔽 Right
Cancel

# ADAPT THE COLOR SCALE

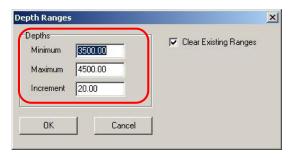
You can change the depth scale by right clicking on it.



You can load existing scales (File > Load) or set a new one



There you have to enter your depth range and the steps for the color scale.



# SWITCH THE MATRIX

It is sometimes necessary to load a new matrix during your survey if you are going out of the first one. You first need to prepare the new matrix (see previous chapter about creating a matrix).

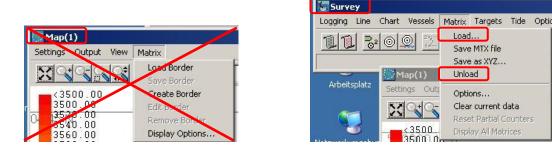
You then have to unload the old matrix from your map window (if you don't then Hypack might keep trying to display in the old matrix).

For this do not use the Matrix button in the Map window...but the Matrix button in the Survey window!!! Matrix > Unload

You can then load your new matrix file.

Matrix > Load

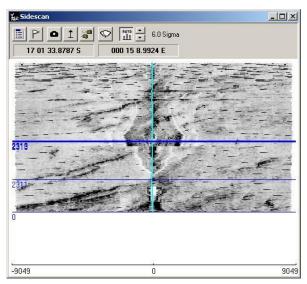
Choose your new file.



Wait a little for the logging to start in the newly loaded matrix. It can sometimes be necessary to shortly stop and restart the logging for the program to start drawing in the new matrix.

# SIDESCAN WINDOW

The sidescan window represents an 'acoustic picture' of the seafloor.



You can setup 🗐 the display parameters as follow:

🐜 Sidescan Controls		
Colors Gain Display Bottom Track	ing	_,
Gray Scale Lodd Copper Rust Pastel Intensity Custom	Invert Brightness Contrast	
	Reset	
Default Values Apply	Close	

🚂 Sidescan Controls	- 🗆 🗵
Colors Gain Display Bottom Tracking	
Basic TVG	_
Sensitivity 6.0 Sigma	
Apply TVG = dBs / 100 Meters	
Apply TVG = P1*log(r) + P2*r + P3	
P1 0.00 P2 0.00 P3 0.00	
Default Values Apply Clo	se

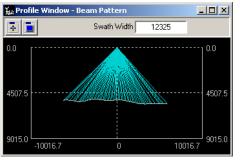
Range Lines			
Enabled	Spacing (M	eters)	50.0
Colors			
Display Range			
In Meters (Enter 0 fo	r Actual Range)		
0	7.6		
Sidescan Channel			
	C Starboard	Both     Both     Contemporate     Second Cont	
O Port			

lescan Controls	
olors   Gain   Display Bottom Tracking	
Use HYSCAN Bottom Tracking	
C Use Fish Sensor	
C No Bottom Tracking	
Default Fish Altitude	0
Blanking 1.0 Gate Size	1.0
Sensitivity 6	
	[

#### OTHER WINDOWS

#### **PROFILE WINDOW**

The profile window shows the dispersion of the signals and visualizes the holes where the depth is interpolated.

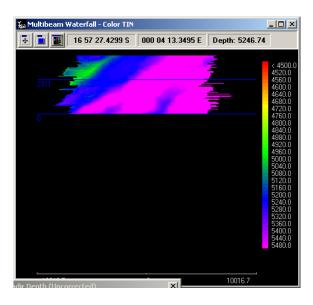


#### NADIR DEPTH

This window displays the depth under the ship. Uncorrected means that the SVP and ship draught are not taken into account for this display).



# MULTIBEAM WATERFALL



# **OPEN FILES AFTER THE SURVEY**

Data in G:\Hypack\_projects\nameofmyproject\Raw

### HYSWEEP EDITOR: OPEN BATHYMETRY DATA

If you need to visualize your recorded data again, you can of course activate your matrices in your project in Hypack (if you saved your online data before exiting the survey).

But you can also get nicer maps from the editor.

Setups described here are intended for you to get a map quickly. If you want you can play around with the parameters as the raw data aren't modified.

#### In Hypack (Administrator):

Hysweep > Hysweep Editor (MB Max)

🐔 Hysweep Editor (MB Max)	_ 🗆 ×
File Edit View Tools Help	
	X

File > Open

Select one or several HSX files from your raw data folder.

	🐔 Search and Filter Options	×
	General Statistical Search Only Bordering	
	Min Depth 0.00 Max Depth 0.00	<b>-</b>
File Open Options	T Beams	_
	Edit Phase 2	
Vertical Basis	Port Angle Limit 45	
Depth     C Elevation	Starboard Angle Limit 45	
	Port Offset Limit     50.00	
Auto Processing	Starboard Offset Limit 50.00	
Enabled	🔲 Spike Limit 0.00	
Auto Save on Exit	Quality Limit 1 32767	- 11
	Intensity Limit I 32767 Filter Overhang and Undercut Topography	- 11
Search and Filter Options	Use Hysweep Survey Limits	
	r Savitsky-Golay Filter	
Log Edit Transactions to MBE ditlog.txt	Enabled High to Low Gate Size 1.0	-
	Order 2 Window Size 7	-
<<< Back OK Cancel		
	Number of Filter Passes 3	
	Number of Filter Passes	
	Run Filters Reset All OK	
	Begin Search Apply Cance	el le

You can set a minimum and a maximum depth (all signals outside the range will be ignored). Then click OK.

Corrections - ANT27-1_20103240800_0.H5X	X Matrix Options
Tide Corrections         Tide File         Open File         Sound Velocity Corrections         SV File         Echosounder setting (Multiple transducer only, m/sec)         1500.0         Open File         Open File         Velocity Corrections         Open File         Open File         Open File         Open File         Open File         Open File         OK         Cancel	Matrix  Use Hypack MTX File  Auto-Size to Data  F Rotate to Survey Line  Cell Size  Auto Cell Size  Enter Cell Length and Width Length 150.00 Shallow Default Width 150.00 /</td

You can add a tide model and a SVP files. Then click OK.

You can either ask the program to determine the cell size by itself (usually quite big, so resolution is low) or set the cell size you want (the same as your matrix for example). Then click OK.

(navigation, heading, heave, pito	n, rollj.		
Atlas Hydrosweep DS	•	🔽 Load Sidescan (if available)	
Navigation			
Hypack Navigation	•		
Heave		Heading	_
Atlas Hydrosweep DS	•	Atlas Hydrosweep DS	
Pitch / Roll		Tide	
Atlas Hydrosweep DS	•	None	]/

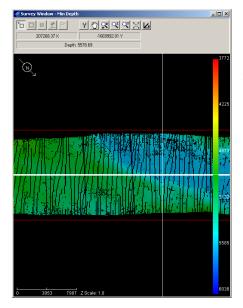
Check the devices are selected as above. Then click  $\ensuremath{\mathsf{OK}}$  . The processing starts.

Hysweep Editor (MB Max)	×
Converting Raw to Corrected	el

It takes some time, depending on the size of your data. If the processing window disappears and nothing happens then the processing has failed:

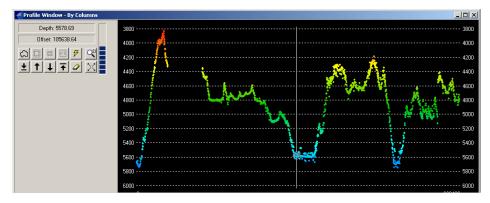
- You chose too many files and the memory needed is too large (reduce your file number and/or the cell size)
- One or several of your files contain errors (test each file individually)

But if everything works alright then you get those three windows:

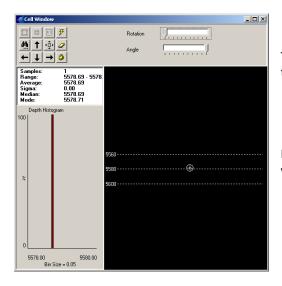


The survey window containing a map of the seafloor along the chosen transects.

When this icon  $\fbox$  is selected then you can chose locations in your survey window which will be displayed in details in the two other windows.



The profile window shows you the topography as a transversal cut along or across your transect (depending on your selection) at the location selected in the survey window.



The cell window summarizes the statistics used to determine the value of the cell selected in your survey window.

Here the cell size has been chosen so small that only one value is available per cell.

### SIDE SCAN EDITOR: SAVE SIDE SCAN DATA AS A GEOTIF

You can create a georeferenced picture (.tif) from your side scan data (contained in your HSX file from your Hysweep survey).

The data processing is quite long so we recommend you to work on small files and to process one after the other. It is better for most software to have several smaller pictures than a single bigger one.

#### In Hypack (Administrator):

Side Scan > Side Scan Targeting and Mosaicing



File > Open

Chose one or several HSX\_xxxx.LOG (Catalog File .log). You can then select one or several HSX files (Hysweep Raw ASCII, .hsx).

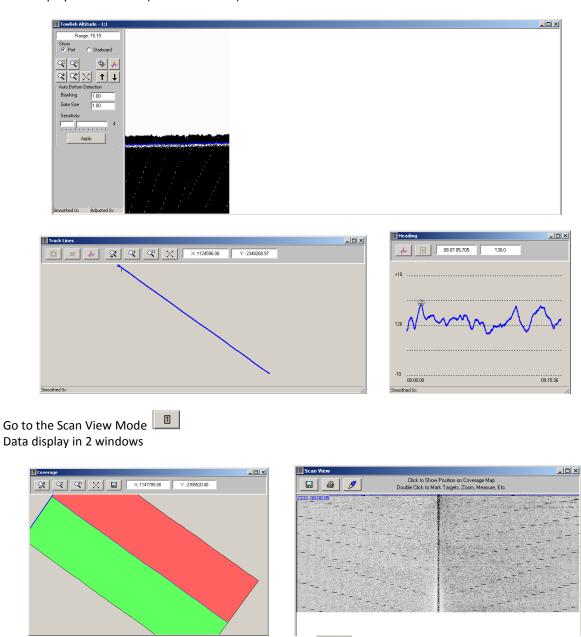
ANT27-1 201 ANT27-1_201 ANT27-1_201 ANT27-1_201 ANT27-1_201 ANT27-1_201 ANT27-1_201 ANT27-1_201	0_3240800_0.HSX (1889) 0_3240915_0.HSX (1252) 0_3240915_0.ALSX (1252) 0_3241350_0.HSX (2192) 0_3241447_0.HSX (8787) 0_3241473_0.HSX (3296)	4 Bytes), Not Saved 20704 Bytes), Not Saved 121 Bytes), Not Saved 501 Bytes), Not Saved 3210 Bytes), Not Saved
ANT27-1_201	03242253_0.HSX (2399)	3442 Bytes), Not Saved
ANT27-1[201	Select >	Exit Catalog

Smaller single files are easier and quicker to process.

Sonar	C Override Sound Velocity
Atlas Hydrosweep DS	1500.0 Meters/Sec
Navigation	Heading
Hypack Navigation	Atlas Hydrosweep DS
Snap to Line	Select Frequency
	OK Cancel

The processing starts.

Sidescan Mosaic	×
Loading ANT27-1_20103220000_0.HSX Cancel	



Data display in 3 windows (Raw Data mode)

Setup your display options with View > Sidescan Controls

<u> </u>
4.194e+06
Ad The data is a specific of the data in the data is a specific of the

Sidescan Controls	
Colors Gain Display	
Basic TVG	
🔽 Auto TVG	4.194e+06
Sensitivity 5.0 Sigma	
Apply TVG = dBs / 100 Meters	
Apply TVG = P1*log(r) + P2*r + P3	
P1 0.00 P2 0.00 P3 0.00	
Default Values Apply Apply To All Files Close	

Got to the Mosaic Mode

Select Files to Include in Mosaic	
Restart         Nex>           W1221_2010_32405         →           W1221_2010_32405         →	
Mosaic Setup Recolution 20.00	
Image Size (Megapixelt) Overlapping Areas C Average C Maximum C Overlay	
T Multiple (TIF Files (one per line) ▼ Fil Gaps Fillers ▼ Average C Sharpen	
Border File Browse	
Add to Batch File	

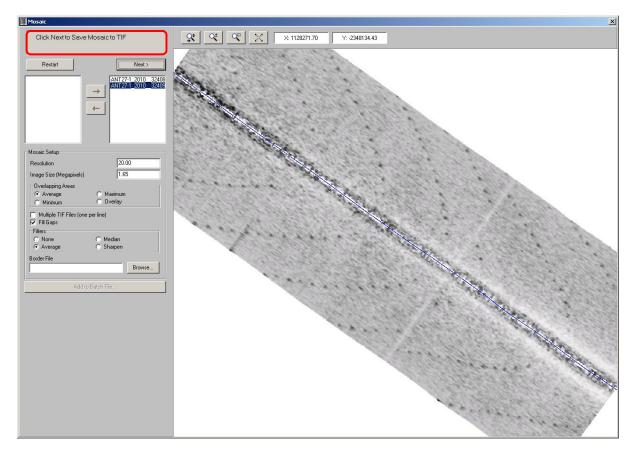
Select your files by bringing them from the left to the right column with the arrow  $\square$ . Then click Next.

Mosaic	
Enter Resolution Then Click Next for Image Size	X         X         1128202.03         Y:-2349434.95
Restart Next >	
ANT27-1_2010 32408 → ←	
Mosaic Setup	
Resolution 20.00	
Image Size (Megapixels)	
Overlapping Areas	
Average     C Maximum     Overlay	
Multiple TIF Files (one per line)	
Filters C None C Median	
Average     C Sharpen	
Border File Browse	
Add to Batch File	

Enter the wished resolution the click Next. The size of the picture is calculated.

Mosaic	
Click Next to Begin Mosaic. Click Add to Batch File for Auto Processing	X         X         1128225.25         Y: -2351571.50
Restart Nest > ANT271_2010_32408 ANT271_2010_32408 ←	
Mosaic Setup Resolution 20.00 Image Size (Megapixels) 1.65	
Overlapping Areas © Average C Maximum © Minimum C Overlay	
Multiple TIF Files (one per line)     Fill Gaps     Fillers     C None     C Median     C Average     C Sharpen	
Border File Browse	
Add to Batch File	

If the file size is ok then click Next. (If not change first the resolution, the file size will be calculated again.) You mosaic appears in the window.



Click Next to save the picture displayed as a geotif.

You have created a georeferenced tif picture that can be displayed on your Hypack project or in a GIS software.

# AT THE END OF THE CRUISE

Copy your files to bring them back to your institute. Data in G:\Hypack\_projects\nameofmyproject

#### The most important are the raw data:

Raw data in G:\Hypack\_projects\nameofmyproject\Raw

- HSX
- RAW
- HSX.LOG
- RAW.LOG

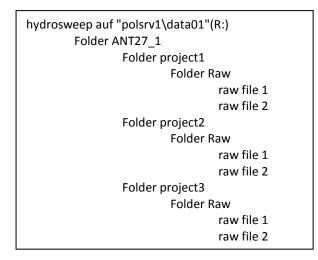
For a description of the different formats check in the appendix of the Hypack manual (in Hypack help).

You also have to give your data to the system manager for the AWI archives.

For this, log in as bathyuse on PC1, 2 or 3. This gives you access to the following network: hydrosweep auf "polsrv1\data01"(R:)

There create a folder for your cruise containing a folder for each of your projects where you only need to copy the raw data.

Example:



### APPENDIX

#### HYPACK DISPLAYED ON THE BRIDGE OR IN THE WINCH ROOM

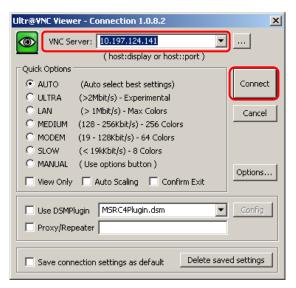
You have the possibility to get your bathymetry measurements displayed on a computer on the bridge and in the winch room.

The technique described here allows you to mirror your screens from the E-550 room (bathymetry lab), computer mcpc1ds3 or mcpc2ds3 to the dedicated computers on the bridge or in the winch room (ask the crew to identify the monitors!). It is more or less as if you were adding more screens to the bathymetry computers. The data are still recorded in the bathymetry lab.

You get exactly what is displayed on the connected computer and you have the possibility to remotely act on them, this means you can change the settings.

We recommend you the setup the whole system in the bathymetry room first and then to move to the other computers.

To get the display from the bridge (or the winch room): Start UltraVNC Viewer on the computer where the data has to be displayed (bridge or winch room).



Choose the server:

- mcpc1ds3: 10.197.124.140 (main server, 3 screens)
- mcpc2ds3: 10.197.124.141 (recommended, 1 screen)

Then click Connect.

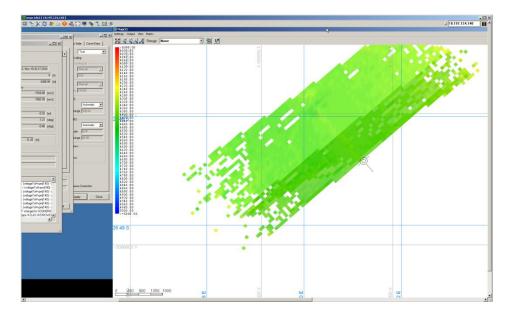


Password: SALTA

	-	
Control ATLAS HYDROSWEEP DS Senso	r - Client 1 - PST_HS_MINSI	
Operation Applied Data Sounder E		그× cStyle Cu
10000		Title
C Transmission Shading	□ Ⅲ   ♥  ↓ / ●	caing
C Reception Shading	Echo Sounder Control Measurement Data	Scaling (m)-
C Receiver Band Width	Mo 22, Nov 19:30:55 2010 Data Set Time Mo 22, Nov 19:30:55 2010 PST_HS_MINS1	Manual
Receiver Amplification	Connection State is connected Data Set Age 0  s	s) 0.00
C Sonar Target Settings	Depth 4389.17 (r	m) Mariusi
C Automatic Transmission Termination	Water Sound Velocity	From on
- Slave Date Recording	Transmission State RUN CKeel 1518.00 (m/s)	
Stave Data Recording     ON (Caution: Standard Data Record	C-Mean 1503.76 [m/s]	
	Mo 22, Nov 19:30 55 2010 ATLAS HYDROSWEEP Motion Data	Autor
High Order Beamforming	SOUNDING Heave 0.39 (m)	lange 100.00
P ON	Sensor Operation State MBES Rol 1.02 [deg]	(B)
	Pitch 0.63 [deg]	Autor
		ude 0.00
	Operation Mode SOUNDING Ship's Data Draught 11.20 [m]	ange 20.00
	bindon 1 1120 for	
	User	- kins
	User Name hydro	
	Logged in Since 22 11.2010 15:31:41	
-Sensor Operation	Message List	
Mo 22, Nov 1	Date         Type         Message           2010.11.22.18.44.23.T         HVPM Status Message: PM: Actual voltage[96] < [vsitageTeHvpm(140] - v	
BUN ATLAS HYDF	2010-11-22 18 44:23 T HVPM Status Message: PM: Actual voltage[110] < [voltageToHypm(140] -	eave Correction
FOUNDING MEES	2010-11-22 18:44:22 T HVPM Status Message: PM: Actual voltage[34] < [voltageToHvpm[140] - v 2010-11-22 18:44:21 T HVPM Status Message: PM: Actual voltage[78] < [voltageToHvpm[140] - v	
Mo 22 Nov 1	2010/11/22 18:44/20 T HVPM Status Message: PM: Actual voltage[62] < [voltageToHvpm[140] - v	Apply
Help	2010-11-22 18.44.19 T HVPM Status Message: PM: Actual vokage[45] < [voltageToHvpm[140] - v 2010-11-22 18.44.18 T HVPM Status Message: PM: Actual vokage[28] < [voltageToHvpm[140] - v	el l
	2010-11-22 18:43:57 T Transmission Mode for Sounder PST_HS_MINS1' changed to SOUNDINC	
	2010-11-22 18:43:29 T Updated Control Data Set MBES_2 for sounder type %TLAS HYDROWEL	

If you are displaying from mcpc2ds3: 10.197.124.141 (recommended), then you're finished.

If you are displaying from mcpc1ds3: 10.197.124.140 (main server) click twice on the Select full desktop icon icon to make all three screens reachable through the scroll left/right bar.



**N.B.**: You also have the possibility to draw the Hypack license to those computers but this bring the risk to lose track of your data (which are by default saved on the computer where Hypack is running)

### POSSIBLE SOURCES OF ERRORS

### Feel free to add anything that happened to you!!!

### ATLAS HYDROMAP SERVER

• Atlas Hydromap Server has lost the connection/stopped: start it again by clicking on the icon on the desktop

# ATLAS HYDROMAP CONTROL

- The pigging doesn't start: first be patient...it can take some time. If nothing happens then go through the whole procedure again (disconnect or stop the multibeam)
- If it doesn't start after 5 minutes, try again (switch OFF then back ON) or ask the ship technician for help!!!

# НҮРАСК

- You are logging but do not get any data displayed in the map window: Do you have a matrix? Are you within the matrix?
- You only get a really narrow track: right click on the Multibeam Waterfall window and check your Range (min, max depth and width)
- The data doesn't display in your new matrix: did you unload the old one?
- The display is slow or blocked: try closing some windows
- The program doesn't seem to log anymore: restart the survey or Hypack
- Your matrix has moved: did you change the geodesy after having started the survey?

# ULTRAVNC VIEWER

• You cannot connect from the bridge or the winch room to the computers in E-550 with UltraVNC Viewer: check that UltraVNC Viewer and Ultra VNC Server are not already running on both computers (you might have to force them to stop with the task manager)

# ATLAS HYDROMAP CONTROL SETTINGS

System > Control echosounder

ontrol ATLAS HYDROSWEEP DS Sensor - Client  peration Applied Data Sounder Environment  Received Data Data Set Time Sounding ID  Depth [m] Port Center Starboard  Cocking  CLocking  CLocking  System Unlocked	Basic Settings     Advanced Settings     Save/Load       Depth Window     [m]       Minimum Depth     2000     [m]       Maximum Depth     6000     [m]       System Depth      [m]       From      [m]       Tracking Window Mode     Fixed Min./Max. Depth Limit     Image: Comparison of the peth limit       Swath Width     Image: Comparison of the peth limit     Image: Comparison of the peth limit       Port     250     [% of Depth limit       Starboard     250     [% of Depth limit       Image: Swath Width Limitation: +/-     10000     [m]       Beam Pattern     Beam Spacing     Equal Footprint	Side Scan         Coverage by Swath         Coverage Port       300       [%]         Coverage Stb.       3000       [%]         Horizontal Distance Port       9000       [m]         Horizontal Distance Stb.       9000       [m]         Resolution       ©       Sample Distance       10000         © Sample Distance       1.000       [m]         © Maximum Side Scan Resolution       Water Column       Distance before Bottom Contact	
ensor Operation STOP ATLAS HYDROSWEEP STANDBY STANDBY MBES Do 11. Nov 19:50:43 2010		-Used by Echo Sounder: MBES idited by User: MBES	

### OPERATION: SETUP MIN AND MAX DEPTHS AND SWATH WIDTH

- You must set your minimum and maximum depth.
- Tracking window mode: fixed min/max depth limit (variable limit would also work but has trouble dealing with steep slopes)
- Swath width: 400 (4 times water depth)
- Beam spacing: equal footprint Desired number of beams must always be 345!!!!

# APPLIED DATA

Control ATLAS HYDROSWEEP DS Sensor - Client 1 - PST_HS_MINS1	
Operation Applied Data Sounder Environment   Basic Settings   Adva	anced Settings Save/Load
Sounding System Depth 4613.12 [m] Last Trigger 20.52.07 Voltage 140 Duty Cycle 0.896 Shading FullB	M
Pulse Length 15.00 [ms] Beam Steering Direction Vector North 10 East 10 Down 1	
PHF     PHF(B)       Shading Table [Hamming]     [30]       TVG PHF     [0N]	
Receiver Band Width         PHF           Dutput Sample Rate         0.75         [kHz]           Band Width         16         [% of Output Sample Rate]	
STOP         Diff. Nov 205212 2010         Modificati           ATLAS HYORDWEEP         SUUNDING         Mees           Diff. Nov 19:49:35 2010         Image: Control of the second se	C Local - Edited by User : MBES_200_500
	<u>Apply</u> <u>D</u> K <u><u>Cancel</u></u>

### Don't touch anything!!

SOUNDER ENVIRONMENT: CHECK SVP INTEGRATION

ontrol ATLAS	HYDROSWE	EP DS Sensor - Client	1 - PST_HS_	MIN51							
eration App	olied Data	Sounder Environment	Basic Setting	is Ad	vanced Settings	Save/Loa	d				
Settings					System Depth Sou	rces RL	anking (	lutnut			
System De	pth Source					,					
Controlled	ATLAS HYD	ROSWEEP PHF		•	Bottom Depths						
C Blanking 0	utput				PHF				[m]		
					SLF				[m]		
C-Mean				_	ATLAS HYDE	ROSWEEP	2 PHF		[m]		
Source	Manua			-	ATLAS HYDE	ROSWEEP	2 SLF		[m]		
Manual		1515.00	[m/s]		ATLAS PARA	SOUND P	HF		[m]		
Current C-Mea	n	1500.00	[m/s]		ATLAS PARA	SOUND SI	LF	·····	[m]		
C-Mean Ca	loulation				ATLAS DESC	) 25/30 Ch	annel 1		[m]		
Calculated C-M	lean		[m/s]		ATLAS DESC	) 25/30 Ch	annel 2	·····	[m]		
Standard Devi	ation		[%]		Other Soundi	ng System		3746.50	[m]		
Application of I	Calculated C-	Mean Value			ATLAS PARA	STORE			[m]		
Manual		Apply Calculat	ed C-Mean		Manual Dept	n		1000	[m]		
C-Keel	-										
Source	System	C-Keel		Ľ							
Manual		1500.00	[m/s]								
Current C-Keel		1500.00	[m/s]								
ensor Operation				Current 9	Sensor Control Para	meter Sets-					
STOP		11. Nov 19:55:41 2010 LAS HYDROSWEEP	<b>_</b>	Modifica	ation State	C Rer	note - U	sed by Echo	Sounder	· ·	
		ANDBY		ļ		● Loc	al - Edit	ed by User :		MBES	
STANDBY		ES 11 Nov 19:50:43:2010	-								
	100										
<u>H</u> elp								Apply		<u>0</u> K	Cancel

- C-Keel Source: system C-Keel
- C-Mean Source: Manual when no SVP integrated via Atlas Sensor Manager (1500m/s) System C-Profile when SVP integrated via Atlas Sensor Manager

# BASIC SETTINGS: SETUP PULSE LENGTH

Control ATLAS HYDROSWEEP DS Sensor - Client 1 - PST_HS_MINS1	
Operation Applied Data Sounder Environment Basic Settings Adva	nced Settings Save/Load
Settings  PHF Profil Beam Steering Manual Ref: V. Axis, Heading  PHF Profil Range Manual Steering References Manual Reduct Reduct SLF Profil Range Manual Reduct Reduct SLF Profil Range Manual Reduct	Manual Steering References e Recording No Profile Start Depth 500 [m] ion By Profile Interval e Recording Full Profile Start Depth 500 [m] Start Depth 500 [m] 500 [m] 5101 [m]
Sensor Operation Current See STOP STANDBY STANDBY Do 11. Nov 13:56:59 2010 ATLAS HYDROSWEEP STANDBY MBES Do 11. Nov 13:50:43 2010	nsor Control Parameter Sets  n State
<u>H</u> eb	

• Range: No profile

Control ATLAS HYDROSWEEP DS Sensor - Client 1 - PST_HS_MIN51	_10].
Operation       Applied Data       Sounder Environment       Basic Settings       Advanced Settings       Save/Load <ul> <li>Profile Recording</li> <li>Transmission Sequence</li> <li>Single Pulse</li> <li>Transmission Source Level</li> <li>Depth Controlled</li> <li>Quirent Time Interval</li> <li>B04.000 [ms]</li> <li>Current Time Interval</li> <li>Manual Steering References</li> <li>Pulse Characteristics</li> <li>Pulse Length</li> <li>Manual</li> <li>Transmission has Finished</li> </ul> <li> <ul> <li>Frequencies</li> <li>Desired PHF Frequency</li> <li>15.000 [kHz]</li> <li>Current PHF Frequency</li> <li>Statt Frequency</li> <li>(kHz)</li> <li>End Frequency</li> <li>(kHz)</li> </ul> </li>	al Steering References   Pu < >
Sensor Operation  Current Sensor Control Parameter Sets  Current Sensor Control Parameter Sets	Inder : MBES MBES
<u>Неір</u>	<u>D</u> K <u>C</u> ancel

• Transmission source level: Depth controlled

Control ATLAS HYDROSWEEP DS Sensor - Client 1 - PST_HS_MIN	51
	Advanced Settings Save/Load Advanced Save/Load Advanced Save/Load Advanced Save/Load Advanced Save/Load Advanced S
	nt Sensor Control Parameter Sets fication State
Help	

• Set your pulse length

ADVANCED SETTINGS

• Pulse type: continuous wave

Deration Applied Data	Sounder Environment	Basic Settings	Advanced Settings	Save/Load		
Transmission Shading     Receiption Shading     Receiver Band Width     Receiver Amplification     Sonar Target Settings     Automatic Transmissio     Stave Data Recording			ansmission Shading Along-Ship Shading—	Reception Shading	Receiver Band Width	Receiver Amplific: (
	Di 16. Nov 20:52:12 2010 ATLAS HYDROSWEEP SOUNDING 4BES Di 16. Nov 19:49:35 2010		urrent Sensor Control F odification State		sed by Echo Sounder : ed by User :	MBES_200_500 MBES_200_500

- Alongside shading, mode: automatic
- High Order Beamforming: checked

Control ATLAS HYDROSWEEP DS Sensor - Client 1 - PST_HS_MINS1
Operation Applied Data Sounder Environment Basic Settings Advanced Settings Save/Load
Settings       Transmission Shading         Receiver Band Width       Receiver Amplification         Receiver Amplification       PHF         Sonar Target Settings       Manual Band Width         Automatic Transmission Termination       OFF         Stave Data Recording       Image: Standard Data Recording will be Disabled)         High Order Beamforming       Image: Standard Data Recording will be Disabled)
Sensor Operation           S10P         Di 16. Nov 20.52.12 2010         Image: Current Sensor Control Parameter Sets           Modification State         Image: Current Sensor Control Parameter Sets           S0UNDING         Image: Current Sensor Control Parameter Sets           S0UNDING         Image: Current Sensor Control Parameter Sets
Help QK Cancel

• PHF, mode: automatic

Control ATLAS HYDROSWEEP DS Sensor - Client 1 - PST_H	H5_MIN51	_ [] :
Operation 🗍 Applied Data 🗍 Sounder Environment 🦷 Basic Set	ttings Advanced Settings Save/Load	
Settings <ul> <li>Transmission Shading</li> <li>Receiver Band Width</li> <li>Receiver Amplification</li> <li>Sonar Target Settings</li> <li>Automatic Transmission Termination</li> <li>OFF ▼</li> </ul> <li>Stave Data Recording</li> <li>ON (Caution: Standard Data Recording will be Disabled!)</li> <li>High Order Beamforming</li> <li>✓ DN</li>	<pre>mission Shading Reception Shading Receiver Band Width Receiver Amplification PHF Mode TVG Manual Gain 30 dB Gain Shift 0.00 (dB) Current Gain 30 (dB)</pre>	
Sensor Operation           STOP           ATLAS HYDROSWEEP           SOUNDING           SOUNDING	Current Sensor Control Parameter Sets Modification State C Remote - Used by Echo Sounder : MBES_200_500 C Local - Edited by User : MBES_200_500	
Help		ncel

- PHF, mode: TVG
- Gain shift: 0